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# THE DIAGNOSIS AND END RESULTS OF TUBERCULOSIS OF THE HIP JOINT.

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THIS paper is based on the study of seventy-one cases of tuberculous disease of the hip joint in which the end results or present condition have been carefully evaluated. They embrace all the patients who could be traced and examined among those treated at the Austin Hospital and at the Children's Hospital during the last ten years, nearly all at present being treated being inmates of the Austin Hospital.

The first problem which presented itself was that of diagnosis. Absolute diagnosis is only possible when tubercle bacilli can be recovered from the joint fluid or when a piece of tissue removed at operation shows undoubted evidence of tuberculous disease. These conditions are rarely fulfilled and in most instances we must be content with a clinical diagnosis based on the consideration of the onset, course and X ray findings, the results of special tests and also on more general considerations.

The onset is usually gradual with a limp preceding pain, but occasionally is acute and sudden. Excluding acute joint infection the majority of monoarticular joint conditions in children start insidiously, so that the mode of onset affords but little help. The course is that of subacute arthritis and only in advanced or neglected cases the local and general signs and symptoms are typical of tuberculosis. The classical signs and symptoms of textbooks are not present in the early stages. With modern treatment general symptoms are usually absent and locally the only typical feature is the appearance of a cold abscess. Sometimes tubercle bacilli may be obtained from the contents of this abscess and in any case its appearance without pain or general symptoms and its contents of sterile broken down caseous material and not true pus, is sufficient to clinch the diagnosis. Intradermal and subcutaneous tests are accorded vastly different importance by different observers. In the series at present under review the result of the von Pirquet test is recorded in seventeen cases. Seven patients gave undoubted positive reactions and of these, six were almost certainly suffering from tuberculosis. In three patients the result recorded was a faint reaction and of these, two had tuberculous hip joints. Seven did not yield reactions and of these four had tuberculous hip joints. In two of these the subcutaneous injection of old tuberculin gave rise to positive results.

Radiological examination affords little help in the early stages. There may be general rarefaction, but this is of very little value in differential diagnosis. Distension with fluid may increase the joint space and erosion of cartilage will diminish it. Œdema and thickening of the soft parts may cause relative blurring of the joint and vagueness of definition. Thus far there is nothing in the pathology of tuberculosis that is typical. Diffuse decalcification is seen in many non-tuberculous conditions and distension of the capsule and erosion of the cartilage are not typically tuberculous. Ghomley[1] has shown that tubercle bacilli may be demonstrated in the synovial membrane and even in the bone, when the X ray findings are still negative.

Later on localized areas of rarefaction and destruction of trabeculæ are seen and these may be central or superficially situated on the articular surfaces. Areas of central destruction usually appear first on the diaphyseal side of the epiphyseal line and are vague and ill defined with irregular margins and no surrounding sclerosis. As they are deep in the bone, the joint may escape infection and perfect function may be preserved by adequate treatment (Case 13). Superficial destruction causes irregularity of the articular surfaces and usually there is progressive patchy decalcification of the whole head and acetabulum, although either may escape. The characteristic features are the lack of reaction, the general decalcification and the complete loss of structure in the part involved. Tuberculous foci in other parts of the body, a tuberculous family history, persistence of arthritis after elimination of all foci of pyogenic infection and after a few weeks' rest and fixation are all suggestive of tuberculosis, but none is sufficient for diagnosis. Tuberculous arthritis is characteristically monoarticular.

## END RESULTS.

### Diagnosis Doubtful; Cure With Normal Hip Joint.

The twelve doubtful cases in this series were all monoarticular and all persisted for prolonged periods despite treatment. In eight of the patients the hip is functionally normal and there is nothing to suggest past disease apart from the history. In three there is a minimal limitation of movement. It is interesting to compare with these the condition of a patient who is still under treatment and in whom two normal X ray findings were finally followed by extreme bone destruction. Cure had progressed to the stage of unrestrained weight-bearing, but when recovery seemed to have occurred, with the diagnosis still in doubt, the joint flared up with an obviously tuberculous arthritis. In the remaining patient repeated skiagrams revealed the gradual development and retrogression of a large cavity in the neck of the femur. Its walls are clean cut and the surrounding bone shows some sclerosis suggesting a coccal infection of the Brodie's abscess type. It is possible that the condition was a bone cyst that has retrogressed spontaneously. Elmslie[2] mentions having seen such a case diagnosed and treated as tuberculosis. Functionally the hip is now perfect, except for minimal limitation of flexion and abduction.

Details of these cases are given in Table I; it would seem impossible to diagnose them with certainty. Pugh[3] believes that in the majority of the patients tuberculous infection starts in the red bone marrow of the head of the femur and if such patients are treated before it has got into the joint, perfect recovery is possible. McMurray,[4] on the other hand, thinks that perfect recovery implies wrong diagnosis. Gauvain[5] admits that perfect recovery is possible, but states that confusion with one of the many unclassified conditions may explain some of the recoveries. According to Fairbank[6] if diagnosis is made early while the disease is still outside the joint or confined to the synovial membrane, recovery is possible. Elmslie[2] has seen patients recover with perfect function, but later relapse and have typical tuberculous joints.

These cases form a distinct group. They are clinically tuberculous, though there is no radiological evidence. Very careful attention should be paid to the removal of infective foci and the exclusion of syphilis and tuberculin tests should be made. Treatment must depend on the clinical condition of the joint and if the affection drags on without definitely declaring its nature, diagnostic biopsy as practised at the New York Orthopedic Dispensary and Clinic[7] deserves serious consideration. Whatever the diagnosis of this type of case may ultimately turn out to be, it may be said that up to the stage in which radiological evidence of bone destruction is demonstrable, complete functional recovery is possible.

### Good Functional End Results.

In this series the condition of sixteen patients who had undoubted tuberculosis is classed as a good functional end result (Table II). In one (Case 13) the disease was limited to a small focus in the metaphysis of the head and cure is complete with normal function. In another (Case 28) mobility is complete. The head has been completely destroyed and a false joint has formed above the acetabulum. It is stable and efficient, but is associated with ten centimetres of shortening of the limb. From the point of view of utility the joint is not nearly so good as the fixed joints next to be considered.

The remaining fourteen patients have all recovered with immobile hips. In nine the ankylosis is definitely bony and well marked trabeculæ can be seen passing between the femur and the ilium. In two others the site of the joint appears to be occupied by a solid mass of bone, but in the absence of trabeculation the condition is classed as fibrous ankylosis. The other three cases are examples of fibrous ankylosis.

In all these cases function is excellent. Most of the patients have some degree of flexion and in none is there extreme lateral deformity. With a fixed hip some degree of flexion is necessary for

TABLE I.—DIAGNOSIS DOUBTFUL; CURE WITH NORMAL HIP JOINT.

| Case No. | Age at Onset. | Period Before Treatment. | Treatment. | Time since Treatment. | Present Condition. | Radiographic Appearances. |
|---|---|---|---|---|---|---|
| 1 | 5 years | 2 months | 5 months | 14 months | Normal hip. | Increase in joint space; medial part of head and neck not well defined. |
| 2 | 5 years | 10 days | 2 years | 8 years | Normal hip. | Nothing abnormal detected at commencement of treatment; no later picture. |
| 3 | 10 years | 14 days | 2 years | 4 years | Normal hip. | Nothing abnormal detected at commencement of treatment. |
| 4 | 8 years | 4 weeks | 7 months | 5 years | Normal hip. | Slight general rarefaction. |
| 5 | 7 years | 2 years | 15 months | 3 years 6 months | Normal hip. | Nothing abnormal detected at commencement of treatment 2 years after onset and 6 months later. |
| 6 | 13 years | 1 month | 18 months | 4 years | Normal hip. | Nothing abnormal detected. |
| 7 | 12 years | 2 years | 2 years | 6 months | Normal hip; tendency to *genu recurvatum*. | Nothing abnormal detected after 12 months' treatment and subsequently. |
| 8 | 9 years | — | 9 months | 6 years | Normal hip. | Plates missing. |
| 9 | 10 years | 7 weeks | 6 to 8 months | 7 years | Slight limitation; external rotation and abduction. | Fuzziness of upper part of neck of femur and some slight elevation of epiphyseal line on same side of neck; later mushroomed head with irregular joint space on lower medial side. |
| 10 | 4 years | 3 months | 7 months | 2 years | Flexion, 95 %; adduction and abduction, 50 %; slight limitation of external rotation. | Slight general rarefaction; otherwise nothing abnormal detected. |
| 11 | 14 years | 9 months | 12 months | 15 months | Slight limitation of abduction; external rotation; otherwise nothing abnormal detected. | Definite area of rarefaction on lower surface of neck subjacent to epiphysis which remained constant in all skiagrams and is still present; otherwise nothing abnormal detected. |
| 12 | 3 years | — | 3 years | 5 years | Very slight limitation of flexion and abduction; 12 millimetres shortening; slight limp. | See Figures I-III. |

NOTE.—I am confident that no case of Perthes's disease is included in this group. All the patients and radiograms were specially examined to exclude this disease, and all cases in which reasonable doubt could be entertained have been omittted. Case No. 9 shows mushrooming of the head, but the condition is not Perthes's disease.

TABLE II.—GOOD FUNCTIONAL END RESULTS.

| Case No. | Age at Onset. | Length of Treatment. | Period Since Treatment. | Abscesses and Sinuses. | Site of Disease. | Result. | Deformity. | | | | Function. | Comment. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Flexion. | Adduction or Abduction. | Subluxation. | Shortening (in Centimetres). | | |
| 13 | 10 years | 1 year 6 months | 1 year | No | Neck of femur (central). | Normal hip. | — | — | — | — | Normal. | |
| 14 | 3 years 6 months | 7 years | 1 year | A., S. | Diffuse arthritis. | Fibrous ankylosis (fixed hip). | 5° | Ab. 10° | Yes | R[1] = 5<br>A[2] = 0 | Excellent, with slight limp; sits with evident lumbar kyphosis. | Osteotomy performed for extreme flexion adduction deformity. |
| 15 | 3 years | 8 years | 1 year | No | Diffuse arthritis. | Fibrous ankylosis (fixed hip) | 35° | Ad. Sl. | No | R[1] = 2·5<br>A[2] = 2·5 | Excellent; slight limp; sits well. | |
| 16 | 6 years | 5 years | 1 year 6 months | No | Diffuse arthritis. | Fibrous ankylosis (fixed hip). | 10° | Ab. 15° | Yes | R[1] = 11·25<br>A[2] = 5 | Very good; cork; limp; sits well with kyphosis. | Osteotomy performed for extreme deformity; lurch due to abduction. |
| 17 | 5 years 6 months | 6 years | 15 months | A., S. | Diffuse arthritis. | Bony ankylosis. | 20° | Sl. Ad. | Yes | R[1] = 3·75<br>A[2] = 7·5 | Excellent; slight limp; sits well. | Gliding motion without ugly lurch of shoulders. |
| 18 | 21 years | 1 year 3 months | 12 months | A., S. | Superficial destruction of head and acetabulum. | Bony ankylosis (fixed hip). | 30° | — | No | Nil | Excellent; sits well; slight limp. | |
| 19 | 3 years 10 months | 3 years | 6 months | A., S. | Head; diffuse arthritis. | Fibrous ankylosis. | 30° | Ab. 5° | No | R[1] = 5<br>A[2] = 2·5 | Walks well, with limp and slight lurch. | |
| 20 | 9 years | 2 years | 2 years 6 months | A. | Diffuse arthritis. | Fibrous ankylosis (fixed hip). | 10° | Sl. Ad. | No | R[1] = 1·9<br>A[2] = 4·4 | Good. | Has recently developed tuberculosis of the other hip. |
| 21 | 3 years 6 months | 5 years | Still has sinus | A., S. | Diffuse arthritis. | Bony ankylosis. | 5° | — | Yes | R[1] = 3·75<br>A[2] = 2·5 | Good. | Still has discharging sinus resulting from the presence of a small sequestrum; joint is firmly healed. |
| 22 | 5 years | 3 years | 8 years | A. | — | Bony ankylosis. | 15° | Sl. Ad. | Head displaced up 1½ inches | R[1] = 3·75<br>A[2] = 5 | Excellent; sits with evident kyphosis; very little limp with high heel. | |
| 23 | 8 years | 3 years | 2 years | A. | Abscess cavity in neck and later diffuse arthritis. | Bony ankylosis. | 55° | Ab. Sl. | No | R[1] = 3·75<br>A[2] = 0 | Excellent; sits perfectly; stands well; slight limp. | |
| 24 | 4 years | 6 years | 9 years | A., S. | Diffuse arthritis. | Bony ankylosis. | 50° | Nil | No | R[1] = 3·75<br>A[2] = 3·75 | Excellent; slight limp; sits perfectly. | |
| 25 | 15 years | 2 years 6 months | 2 years | A., S. | Diffuse arthritis. | Bony ankylosis. | 15° | Nil | Yes | R[1] = 4·4<br>A[2] = 4·4 | Excellent; slight limp; cork; sits with lumbar kyphosis. | |
| 26 | 3 years | 8 years | 5 years | No | Diffuse arthritis. | Bony ankylosis. | 85° | Sl. Ad. | No | R[1] = 1·9<br>A[2] = 2·5 | Excellent; slight limp; sits normally. | |
| 27 | 5 years | 11 years | 2 years | A., S. | Diffuse arthritis. | Bony ankylosis. | 45° | Ad. 5° | Slight | R[1] = 4·4<br>A[2] = 6·2 | Excellent; slight limp; sits and stands well. | Says she walks better without cork; bends good knee and walks without lurch. |
| 28 | 12 years | 2 years 6 months | 2 years | A. | Acetabulum and head; diffuse arthritis. | Mobile joint. | — | — | Yes | 10 | Good; walks with patten with slight limp. | A new joint has formed above site of old one; the head is destroyed and the neck articulates with false acetabulum; movements normal, except for 50 % limitation of abduction; joint is stable; Trendelenberg's sign is not present. |

No. 16: Skiagram taken on August 8, 1928, shows definite bony ankylosis.

[1] R = real shortening.

[2] A = apparent shortening.

sitting in comfort. Too much flexion tends to exaggeration of the lumbar lordosis in standing and is liable to cause a painful back in later life. Pugh[3] considers 35° the optimum amount of flexion for a fixed hip and judging from these patients I would agree with him that the best position for ordinary use is 30° to 35° flexion. With this amount of flexion the mobility of the lumbar spine is utilized to the best advantage, so that both sitting and standing are natural and easy. In special circumstances when sitting or standing ease is specially required, less or more flexion may be desirable and it should be remembered that until ankylosis is completely consolidated, flexion will always tend to increase.

Lateral deformity and shortening are closely related. Abduction will conceal real shortening, but the patient with more than a few degrees of abduction walks with an ungainly lurch that makes the condition much more obvious than four or five centimetres of shortening. Two of my patients have noticeable abduction. Both had ankylosis with extreme flexion adduction deformity and in both I performed subtrochanteric osteotomy and put the leg in moderate abduction to correct the shortening. Both now have good functional results and the limbs have developed considerably since they were made capable of weight-bearing, but both have an ungainly lurch which is in contrast to those without abduction. With abduction when the weight is taken on the diseased limb, the body has to be

TABLE III.—UNSATISFACTORY END RESULTS.

| Case No. | Age at Onset. | Length of Treatment. | Period Since Treatment. | Abscesses and Sinuses. | Site of Disease. | Result: Range of Movement. | Deformity. | | | | Function. | Comment. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Flexion. | Adduction or Abduction. | Subluxation. | Shortening (in Centimetres). | | |
| 29 | 2 years | 6 years 6 months | 6 years | A., S. | Diffuse arthritis. | 60° flexion and fair adduction movement. | 30° | Nil | Yes | $R^1 = 6·25$ | Walks fairly well with patten and limp. | Unstable weak joint; Trendelenberg's sign present. |
| 30 | 4 years | 3 years | 7 years | A., S. (op.) | Diffuse arthritis. | 10° flexion and slight adduction movement. | 60° | Ad. 15° | Yes | $R^1 = 2·5$ $A^2 = 8·75$ | Walks poorly with patten; tires easily. | Weak unstable joint; Trendelenberg's sign present. |
| 31 | 9 years | 5 months | 4 years | A., S. | Diffuse arthritis. | 30° flexion and full adduction movement. | 0° | Sl. Ad. | Yes | $R^1 = 5$ $A^2 = 6·25$ | Walks with bad limp; no support. | Weak unstable joint; Trendelenberg's sign present. |
| 32 | 3 years 6 months | 3 years | 6 months | A., S. (op.) | Diffuse arthritis. | 25° flexion and 20° adduction movement. | 10° | 0° | Yes | $R^1 = 2·5$ $A^2 = 2·5$ | Walks poorly, with bad limp. | Weak unstable hip; Trendelenberg's sign present. |
| 33 | 8 years | 1 year 9 months | 5 years | A. | Diffuse arthritis. | 20° flexion and slight abduction and adduction movement. | 45° | 0° | Yes | $R^1 = 6·25$ $A^2 = 6·25$ | Walks poorly, with typical limp and lurch; cannot walk without stick. | Trendelenberg's sign present; has a calcified pelvic abscess, and has recently developed abscess in buttock with no sign of lighting up of the joint. |
| 34 | 1 year 6 months | 12 years | 6 months | A., S. | Diffuse arthritis. | 85° flexion movement. | 15° | Sl. Ad. | Yes | $R^1 = 7·5$ $A^2 = 7·5$ | Walks with crutch and limp. | Constantly relapsing hip; seems healed after 3 years' continuous treatment, but will probably break down again. |
| 35 | 26 years | 3 years 3 months | 1 year | A. | Head and acetabulum. | 70° flexion and full adduction and rotation; 50 % abduction. | 0° | 0° | No | $R^1 = 2·5$ | Walks well with stick and limp. | Has also healed spinal and quiescent lung tuberculosis; 12 months after apparent cure developed an abscess in buttock; has now been well 12 months. |
| 36 | 15 years | 31 years | 2 years | A., S. | Diffuse arthritis (bilateral). | False joints with gross deformity and maldevelopment. | 60° R. and L. | 0° | Yes R. and L. | Extreme | Cannot walk. | Also tuberculosis of spine and shoulder and left foot (amputated). |
| 37 | 5 years | 13 years | 2 years | A., S. | Diffuse arthritis. | Fibrous ankylosis. | 50° | Ad. 20° | Yes | 60 | Useless; walks with crutches. | Extreme interference with growth of whole lower limb. |

[1] R = real shortening. [2] A = apparent shortening.

No. 16: Skiagram taken on August 8, 1928, shows definite bony ankylosis. [1] R = real shortening. [2] A = apparent shortening.

thrown over to that side to get the centre of gravity over the supporting foot. A trace of adduction gives a smooth gliding motion and is the position attained at the normal hip joint during walking. Shortening up to five or seven centimetres is not a very grave handicap and can be easily compensated by a cork sole, but in this series all except two of the patients say that they are more comfortable without the cork and counteract their shortening by flexing the knee on the sound side.

#### Unsatisfactory End Results.

Nine cases (Table III) are classed as unsatisfactory results. In one the joint is well healed, but the limb is functionally useless owing to interference with growth. Another is a case of widespread bone tuberculosis including bilateral hip disease; the patient is now bed-ridden. In the remaining seven cases there has been gross bony destruction with loss of the articular surfaces and healing with some degree of movement. In all except one there is some deformity; the radiograms reveal subluxation of the joint and there is real or apparent shortening of three to ten centimetres.

Only one patient (Case 35) has efficient function and her cure is by no means safe. She illustrates the tendency to abscess formation and relapse after cure that is frequently seen with these unstable hips; her condition will be dealt with more fully in discussing the lesions that are still active.

#### Deaths.

Thirteen deaths were traced. In two patients the cause was not ascertained, in one it was due to pneumonia following whooping cough and in one to pyelo-nephritis secondary to undetected renal calculi. Six died of tuberculous meningitis and two of generalized tuberculosis without meningeal involvement. One death was due to amyloid disease.

#### Patients Still Undergoing Treatment.

Twenty-one patients are still undergoing treatment. Twelve of them have had abscesses at some stage during treatment, seven have at present discharging sinuses and four have scars of old healed sinuses. In thirteen treatment has been continuous for an average period of four years. All show some destruction of the femoral head and acetabulum and in none can anything approaching normal mobility be expected. Subluxation is detectable in the radiograms of six.

Seven patients are doing well as regards immediate cure and will eventually be discharged quiescent. In six the process is still very active and of these two are riddled with sinuses and are in an advanced stage of amyloid disease. The disease in seven patients with an average time since onset of over twenty-one years, has been quiescent and has relapsed once or more often. In one patient the healing lasted for over twenty years and in another for twenty-five years. All these are examples of apparent cure with fair mobility and with loose fibrous ankylosis. They illustrate the danger of slight or moderate mobility.

Pathologically the healing of tuberculosis is by excapsulation and fibrosis. Probably the disease is never really cured, unless there is complete calcification and if the quiescent lesion be subjected to the constant strain of checking movement, relapse is certain. In addition many patients are left with subluxated hips in which the weight is being supported by the fibrous bands between the femur and the ilium, and thus again excessive strain is thrown on the unstable scar.

The remaining patient at present undergoing treatment was treated for two years for tuberculosis of the left hip and discharged cured two and a half years ago (Case 20, Table II). Six months ago he developed tuberculosis of the right hip and for this he is now undergoing treatment. The left hip is firmly healed.

The results of these seventy-one cases are summarized in Table IV.

Table IV.—Summary of Results.

| Classification. | Number of Patients. |
|---|---|
| Uncertain diagnosis; cure with normal hip .. | 12 |
| Good functional result— | |
| Mobile .. .. .. .. .. | 2 |
| Fibrous ankylosis .. .. .. .. | 5 |
| Bony ankylosis .. .. .. .. | 9 |
| Unsatisfactory result .. .. .. .. | 9 |
| Deaths .. .. .. .. .. .. | 13 |
| Still under treatment .. .. .. .. | 21 |
| Total .. .. .. .. | 71 |

The incompleteness of the follow-up makes statistical analysis of these figures valueless. The large number of deaths is explained by the fact that they occur in hospital and are therefore easily traced.

#### Treatment.

As a guide to treatment one may say that in clinically diagnosed tuberculosis of the hip complete return of function may be confidently anticipated unless or until there is radiological evidence of destruction of the articular surfaces. In these cases, therefore, treatment should be by extension with the hip in abduction to prevent pressure on the articular surfaces and this should be continued till all signs of activity have ceased. Extension is then relaxed by gradual stages till all restraint is removed while the patient remains in bed. Active, non-weight-bearing movements are encouraged. If there is any return of activity as evidenced by pain, spasm or diminution in the range of movement, extension and fixation must be reapplied. If all goes well, after three to six months of unrestrained freedom in bed the patient should be allowed up in a walking caliper and this should be continued for at least another six months.

When the radiograms reveal definite destruction of the articular surfaces there would appear to be little hope of a mobile hip with safe and useful function. Treatment should be by traction in abduction while the disease is active, to minimize bone erosion as far as possible and especially to prevent the common upward subluxation by taking pressure off the upper lip of the acetabulum. When the active stage is passed, abduction should be gradually lessened and the hip then fixed in plaster with about 5° abduction and 10° flexion. At least six to nine months should be allowed for fixation before weight-bearing is started. During this period increase in flexion and decrease in abduction can be readily attained by removing the plaster and encouraging the required deformity. If consolidation is progressing satisfactorily with extensive calcification, abduction should be reduced to 0° and flexion encouraged up to 20° to 25° and it should always be remembered that in the end there will probably be more flexion than was aimed at. Finally, weight-bearing in plaster is permitted and the plaster or celluloid spica is retained until the joint is finally and immovably fixed. When the plaster is removed, careful watch is maintained for increase of flexion and if this is occurring, a further period of fixation is required. In these circumstances the surgeon frankly aims at ankylosis; if subluxation is prevented in the active stages by abduction and traction, fibrous union with no movement can usually be obtained despite extreme destruction of the head of the femur or the acetabulum. Bony ankylosis is usually looked on as a rare end result in tuberculosis of the hip, but in my series it is present in nine out of the fourteen patients with ankylosis. These patients were all discharged cured with firm fibrous ankylosis and continuity of trabeculæ from femur to ilium has been demonstrated only in the radiograms taken some time after return to functional activity. The earliest age at which bony ankylosis was recognized was eight years in a patient whose disease started at the age of three and a half years.

The five patients with fibrous ankylosis have been cured at a relatively recent date, none of them more than eighteen months ago. Of the patients with bony ankylosis seven have been living normal lives for two years and more, one is still in the Austin Hospital, but has had no restraint or treatment for fifteen months and the other has been up in a walking caliper for twelve months. In these two (Nos. 17 and 18, Table II) trabecular continuity has only just become apparent (see Figures VI and VII) and I am hopeful that in the five patients who at present have fibrous ankylosis, this will eventually become bony in the same way.

Subluxation makes it difficult to attain firm ankylosis but its occurrence should be unusual with efficient abduction treatment. If it has occurred, with the almost inevitable resultant adduction it would seem better to aim at fixation with deformity and to do an osteotomy later when ankylosis is firm than to try to correct deformity by traction or force. Two patients for whom I adopted this principle, have done excellently. Their joints are now fixed with no tendency to further adduction. Operative attempts to fuse the hip joint have failed notoriously, though Hibbs[9] has reported twenty cases of attempted fusion by an extraarticular operation with eighteen successes and one death from miliary tuberculosis. Briefly he uses a portion of the trochanter and upper part of the shaft of the femur to form a bridge between the ilium above the acetabulum and the remaining portion of the trochanter. In a successful case the graft becomes fused with the trochanter and the ilium providing extraarticular fixation and later the joint itself becomes solidly fused and the ultimate cure depends on this ankylosis and not on the graft. Apart from "internal splinting" nothing is done to encourage ankylosis in the joint and I believe that in many patients the same result may be obtained by conservative means. If it is shown that this or other arthrodesing operation will reduce the time required to produce ankylosis and will increase the certainty of its occurrence without increasing mortality, it must be accepted as part of the treatment of tuberculosis of the hip.

Cold abscesses, if they occur, are best treated by repeated aspiration. If difficulty is experienced in evacuating the contents, the use of modifying fluids as recommended by Calot[9] should be tried. Extensive, rapidly filling abscesses indicate severe disease and, whether they are open or closed, add to the gravity of the prognosis. Slowly forming abscesses and chronic indolent sinuses with little discharge are of small moment and will disappear and heal as the destructive condition ceases.

Perhaps the liability to and the risk of secondary infection is overestimated, but it is always grave. In severe cases with extensive bone destruction and much caseation and softening the abscess infiltrates widely, leading to multiple pockets and fistulæ with intense absorption and amyloid disease and death is too often the result.

One other point seems worthy of mention. In three of the seventy-one cases reported renal calculi developed whilst the patients were under treatment. I have seen the same occurrence in one patient with a tuberculous spine and in another with osteomyelitis. Possibly postural stasis associated with the toxic absorption from the chronic injective foci may have some causative relation to this high incidence of renal stone.

### CONCLUSIONS.

1. Hip disease without radiological evidence of bone destruction may or may not be tuberculous and complete recovery is likely to occur.

2. Once the articular surfaces have been destroyed, the best result obtainable is ankylosis and in a considerable number of patients bony ankylosis may be confidently anticipated.

3. The best position for ankylosis is 30° to 35° of flexion with no abduction or adduction and no rotation.

4. An unstable hip, that is, a loose, fibrous ankylosis with a fair range of movement is weak, functionally inefficient and liable to relapse even many years after apparent cure.

5. Treatment should be by traction in abduction until all activity has subsided and must then depend on the radiological picture. If the articular surfaces are intact, mobility is encouraged. If the articular surfaces are destroyed prolonged fixation in plaster is used to obtain ankylosis.

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I wish to express my appreciation to the members of the surgical staff of the Children's Hospital for permission to investigate the end results of the disease in their patients and to Mr. Trumble, Surgeon to the Austin Hospital, for allowing me to use his material and case reports.

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## THE CHOICE OF THE ANÆSTHETIC.

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THE introduction of anæsthetics in 1846 at once enlarged the field of surgery. This progress has steadily continued, so that operations are now performed on all the organs of the body. These operations are frequently of long duration and are often required in patients who are very seriously ill. The skill of the anæsthetist is often taxed to its utmost to meet these varied requirements and to allow the operation to be performed with a reasonable margin of safety to the patient. The anæsthetist has at his disposal a number of anæsthetics and a variety of methods of administering them; there is no excuse for the practitioner who pins his faith to one drug or one method for every type of condition. The selection of the best anæsthetic for an operation requires the cooperation of surgeon and anæsthetist and a thorough examination of the patient.

I shall discuss the different anæsthetics and indicate their relative advantages by illustrating my remarks with lantern slides of records and blood pressure charts from my own cases.

### Chloroform.

Chloroform as a general anæsthetic is being used less and less. Both practical experience and laboratory work have contributed to this result.

The following are the conclusions of the Committee on Anæsthesia of the American Medical Association,(1) given on June 15, 1912:

> (1) The use of chloroform as the anæsthetic for major operations is no longer justifiable.
>
> (2) For minor operations also the use of chloroform should cease.
>
> (3) Chloroform is sometimes found convenient for initiating anæsthesia in alcoholics or other difficult subjects; it is justifiable only when nitrous oxide is not available. As soon as full anæsthesia is attained, ether should be substituted.

Fleming(2) in analysing a series of seven hundred deaths that occurred in England in the years 1910 to 1913 whilst the patients were under anæsthesia, states that of these 223 died before operation, 531 were due to the anæsthetic itself. Chloroform was responsible for no less than 378 of the fatalities, mixtures containing chloroform another 100 and ether for 28. He is convinced that this appalling death rate would not have occurred had ether been administered.

Miller(3) collected records of one million inductions of chloroform anæsthesia which showed a mortality of 1 in 2,600.

Rosenthal and Bowen(4) have shown that after two hours of chloroform anæsthesia the liver function requires six weeks for complete recovery.

Paton(5) states:

> The effect of chloroform is probably due to tissue anoxemia. The primary action of chloroform is due to its fixation to tissue cells, to its power of checking and finally stopping the processes of oxidation in them, thus ultimately killing them while accelerating the disintegration necrobiotic processes which are the cause of the symptoms of late chloroform poisoning. The cells of the brain are most sensitive to oxygen lack. This fact and the enormous blood supply of the grey matter carrying chloroform abundantly to the brain cells explains the loss of consciousness.

I consider that chloroform is permissible only in the four following circumstances.

1. In the presence of a flame, actual cautery or diathermy where ether might cause an explosion. The following two slides illustrate this:

CASE I.—Record A913 of November 7, 1924. Mr. N., *ætatis* fifty-seven, was operated on by Dr. Newland for recurrent rodent ulcer of the face by excision and cautery.

The induction was by ethyl chloride and chloroform-ethanesal mixture and the maintenance by chloroform using the Shipway apparatus and double airway.

In this type of case where chloroform is not essential for the induction I usually anæsthetize the patient with ethyl chloride and ether by the open method and change to chloroform only when full surgical anæsthesia is obtained. In this way the early syncope is avoided as was pointed out by Boyle.[6]

CASE II.—Blood Pressure Record 591 of March 17, 1927. Mr. McE., *ætatis* fifty-nine, was suffering from a large epithelioma of the tongue and palate and an enormous involvement of the cervical glands. He had dyspnœa from the obstruction and in addition was an alcoholic who drank half a bottle of whisky per day, was a heavy smoker and had a number of septic teeth. After examining him I asked the surgeon to let the relatives understand that he would probably die on the table. Chloroform was given slowly and an endotracheal catheter passed, this improved his breathing considerably. Anæsthesia was maintained by endotracheal sufflation of chloroform vapour with my modification of the Israel Carmody apparatus. Dr. Lindon excised the cervical glands and ligatured the external carotid artery after which Dr. Stanley Verco treated the growth by diathermy. The patient made a good immediate recovery with the exception of jaundice caused by the toxic action of the chloroform on the liver.

2. Where extensive inflammation of the submaxillary and cervical region is present, for example Ludwig's angina.

CASE III.—Record B394 of May 11, 1925. L.S., *ætatis* thirty, was a patient of Dr. John Corbin at the Adelaide Hospital. He had an enormous swelling of the floor of the mouth and neck which was an extension from an alveolar abscess. He could separate his teeth only half an inch and was unable to lie down owing to dyspnœa. His temperature was 40° C. (104° F.), his pulse rate 132 and respiratory rate 26 in the minute. Had ether been administered, any further engorgement of his air passages would have further decreased the airway and caused asphyxia. Chloroform was given for the extraction of a tooth, incision of the alveolar abscess and of the Ludwig's angina.

3. In people suffering from acute lung disease when nitrous oxide and oxygen or ethylene and oxygen is unobtainable or inapplicable. To find a typical example of this I had to look up a record as far back as 1909.

CASE IV.—Record 18 of October 8, 1909. Miss E.B., *ætatis* forty-eight, was a patient of Professor Briggs at the Hospital for Women, Shaw Street, Liverpool. She was an example of that rare combination of mitral disease and pulmonary tuberculosis. Chloroform was given while a hysterectomy was performed for uterine fibroids.

4. In patients who have an idiosyncrasy to ether.

CASE V.—Record B958 of December 3, 1925. Mrs. B. was an alcoholic and exceedingly neurotic woman of thirty-six. As she "always vomited for a week after ether" chloroform was administered by request while Dr. Lynch removed the uterus and appendages. Vomiting took place after this anæsthetic as it did after nitrous oxide and oxygen on another occasion. Probably this was not a true case of ether idiosyncrasy.

I have not included midwifery as an indication for chloroform as open ether is safer and perfectly satisfactory.

*Pre-operative Hypodermic Injection.*

I do not give morphine before chloroform anæsthesia, as it prolongs the induction, causes more shallow respiration and it also lessens the activity of the pupil and so tends to mask the signs of anæsthesia. Atropine should always be given, as it protects the heart by paralysing the terminations of the vagus in the heart and so prevents syncope from vagal stimulation. The usual dose is 0·6 milligramme (one-hundredth of a grain).

**Chloroform-Ether Mixtures.**

I very seldom employ the strong chloroform-ether mixtures as equal or better results may be obtained by safer methods. Alcohol, chloroform and ether ("A.C.E.") I no longer use, as the alcohol has no advantage, unless it is that of still further diluting the chloroform.

"$C_2E_3$" (that is, two parts of chloroform with three parts of ether) is occasionally useful for patients who have a cough or as an aid to easier induction in difficult cases.

CASE VI.—Record 370 of December 21, 1923. Mr. S., *ætatis* twenty-three, was suffering from appendicitis, had a cold and severe cough. Operation was deferred for two days on this account. Ethyl chloride given by the open method followed by a mixture of two parts of chloroform and three of ether was the anæsthetic used. The patient had an exacerbation of the cough for several days. One of the gas anæsthetics would have been more suitable.

"$C_1E_{31}$" (Silk's mixture, one drachm of chloroform in four ounces of ether)[7] may be given in the same way as open ether and is useful in the robust, alcoholic, heavy smoking patient. I use it as a routine for the induction in the returned soldiers at the Repatriation Hospital, Keswick.

CASE VII.—Record X829 of October 22, 1926. F.F., *ætatis* twenty-four, was a returned soldier and a heavy smoker. Dr. Jay performed a radical mastoid operation on him at the Repatriation Hospital, Keswick. Induction which was by the open method with the ethyl chloride-"$C_2E_{31}$" sequence, was without excitement, only taking four minutes. Anæsthesia was maintained with ether and the use of the Israel Carmody apparatus.

**Ethyl Chloride.**

Ethyl chloride by the open method is a safe and pleasant anæsthetic for minor operations such as paracentesis of the tympanic membrane, opening abscesses or extracting one or two teeth. It is also useful as preliminary to ether anæsthesia induced by the open method. I use it as a routine for this purpose. Miller[8] among 50,000 collected records of persons anæsthetized by ethyl chloride found a mortality of 1 in 12,000.

**Somnoform.**

Somnoform given in Parrett's inhaler and with his semiclosed technique, may also be used as a "one dose" anæsthetic for minor surgery.[9]

CASE VIII.—Record A62 of January 24, 1924. L.M., *ætatis* ten years, was anæsthetized with somnoform at the Adelaide Dental Hospital. Induction required two minutes and Dr. Chapman extracted eleven teeth in the next two minutes. The anæsthesia was without excitement and quite adequate for the operation.

**Ether.**

Ether is at present the most general anæsthetic in use, it is applicable to most operations, is inexpensive and comparatively safe. In 900,000 collected records Miller[10] gives the mortality as 1 in 8,000.

There are numerous methods of administering ether, each of which has a particular use.

*The Closed Method.*

Clover's inhaler is still used in Australia, but is losing favour. This method is unpleasant to the patient and often causes considerable salivation. Deep anæsthesia is sometimes difficult to obtain without some cyanosis and consequently there may be rigidity present in a deeply anæsthetized patient. In an analysis of 300 anæsthetics, made in 1909 to 1910, I found that post-anæsthetic vomiting and respiratory trouble were commoner with the closed than the open method.[11] I have not possessed a closed ether inhaler for over sixteen years.

*The Open Method.*

The open method or perhalational ether anæsthesia[12] is in such common use that I shall neither describe it nor show a record.

I always give atropine in full dosage as a pre-operative hypodermic injection; by this I mean 0·0006 gramme (one one-hundredth of a grain) from the age of one year, below one year 0·0003 gramme (one two hundredth of a grain) is given. For certain mouth cases in adults 0·0012 gramme (one-fiftieth of a grain) may be given with advantage. Morphine is seldom required under eight years of age and in children the dosage must be small. For the normal adult 0·01 gramme (one-sixth of a grain) is the most satisfactory dose.

*The Shipway Apparatus.*

I seldom use the Shipway apparatus now except for small children and then generally employ a cylinder of oxygen instead of the hand bellows. For hare lip operations in infants it is a very satisfactory method when a nasal tube or mouth hook is used.

CASE IX.—Record 694 of October 11, 1927. John R., *ætatis* seven months, suffering from a hare lip, was a patient of Dr. Newland at the Adelaide Children's Hospital. Anæsthesia was induced by the open method with ethyl chloride and ether. A nasal tube was passed and attached to the Shipway apparatus. Anæsthesia was maintained with ether and oxygen vapour, while the plastic repair of the hare lip was performed.

*Endopharyngeal Method of Giving Ether.*

Endopharyngeal methods with a motor apparatus, such as the Israel Carmody, Lidwill, Mott or Connell, have certain advantages in eliminating the anæsthetist from the field of operation and giving a regular constant strength of vapour.

Formerly I used this method for operations on the nose and throat, but during the last two years I have used it less and less and prefer endotracheal anæsthesia. The endotracheal method of giving ether has been used forty-seven times in the last fifty patients that I have anæsthetized for operations on the tonsils and nasal sinuses.

*Endotracheal Method of Giving Ether.*

Chevalier Jackson[13] states: "Endotracheal anæsthesia is by far the safest way for the administration of ether for any purpose." It has many advantages for operations in any region from the scalp to the umbilicus. Once the endotracheal catheter is passed, the airway is assured, holding the jaw forward or tongue traction is never required. The position of the patient is immaterial. In brain operations the method of choice is endotracheal.

CASE X.—Blood Pressure Chart 561 of November 8, 1926. Mr. H., *ætatis* forty, a patient of Dr. Newland, was operated on at "Rua" Private Hospital for a pituitary tumour. Ether was administered by the endotracheal method and there was no difficulty about the airway in an operation lasting nearly three hours. The anæsthetist was several feet away from the field of operation.

The flow of air returning between the catheter and the vocal cords prevents blood from trickling down into the lungs during mouth operations.

CASE XI.—Blood Pressure Chart 596 of March 31, 1927. B.H., *ætatis* sixty, a patient at the Adelaide Hospital, was operated on by Dr. Newland for recurrent epithelioma of the lower lip involving the jaw. Anæsthesia was induced by the endotracheal method, the catheter being passed through the nose into the trachea so that it would not interfere with the surgeon.[14]

In plastic facial surgery the method of choice is endotracheal as by other methods it is sometimes difficult to insure perfect aeration without encroaching on the field of operation.

CASE XII.—Record X531 of June 28, 1926. Ralph R., *ætatis* twenty-four, a jockey, had a congenital syphilitic deformity of the nose and also suffered from aortic regurgitation. He was operated upon by Dr. Newland at the Adelaide Hospital. The lip and nose were freed from the upper jaw and a large epithelial inlay was inserted; there was also a plastic operation on the nose. In this case a rubber tube was attached to the endotracheal catheter to serve as a return airway, as suggested by Rowbotham,[15] and the pharynx was then packed. This was done to prevent the outflowing stream of air from spraying blood on to the field of operation.

The same manœuvre was used in the next case for similar reasons.

CASE XIII.—Record 217 of March 25, 1927. Mrs. W., *ætatis* thirty-four, had an unerupted canine tooth buried in the hard palate. Dr. Jay turned up a flap of mucous membrane and chiselled away enough bone to remove the tooth. There was no spraying of blood and the aeration was perfect throughout.

For thyreoid operations with dislocation of the trachea, the endotracheal method of inducing anæsthesia may save many anxious moments, as the airway is always free and the anæsthetic delivered evenly throughout, without any danger of tracheal collapse.

CASE XIV.—Record X601 of July 28, 1926. Miss C., *ætatis* fifty, was a big obese woman with a very large goitre and the trachea was dislocated 3·75 centimetres (one and a half inches) to the right. Dr. Newland removed the left lobe of the thyreoid gland and part of the right lobe, a long and difficult operation, taking over two hours.

In thoracotomy the positive pressure of the endotracheal method of inducing anæsthesia prevents collapse of the lung when the pleura is opened and enables the lung to be blown up to the chest wall if required.

CASE XV.—Blood Pressure Chart 615 of June 8, 1927. Mr. V.H.S., *ætatis* nineteen, a patient of Dr. Lindon, had a small partially collapsed hydatid cyst of the right lung. It was necessary to resect two ribs and explore the lung in order to find and drain the cyst. By increasing the pressure the lung was blown up into the wound for suturing.

CASE XVI.—Blood Pressure Chart 526 of August 18, 1926. Mrs. H., *ætatis* thirty-seven, had an abscess of the lung which was drained by Dr. Newland under ether anæsthesia induced by the endotracheal method. As soon as the exploring needle entered the abscess cavity the characteristic smell appeared owing to the positive pressure in the chest.

Lidwill considers this may be looked for as a localizing sign in this disease.[16]

Upper abdominal surgery is made easier by the endotracheal method of inducing anæsthesia, as the abdominal and diaphragmatic movements are lessened, aeration is good and muscular relaxation is under easy control.

CASE XVII.—Blood Pressure Chart 503 of June 3, 1926. Mrs. C., *ætatis* fifty-three, was a patient of Dr. Newland. An operation was performed for gall stones. When the abdomen was opened the appearance of the gall bladder suggested carcinoma. The gall bladder and a large wedge of liver were removed.

In the lower part of the abdomen also the endotracheal method is often advantageous.

CASE XVIII.—Blood Pressure Chart 637 of September 19, 1927. Miss E., *ætatis* forty-two, a patient of Dr. Smeaton at the Hutt Street Private Hospital, was suffering from fibroids. Subtotal hysterectomy was a long and difficult operation owing to adhesions. The endotracheal method certainly aided in the good relaxation of the abdominal wall.

*Contraindications to Endotracheal Anæsthesia.* There are three types of patient, however, for whom the endotracheal method of inducing anæsthesia is unsuitable: First, those suffering from exophthalmic goitre; the primary deep anæsthesia required for the introduction of the catheter is not in the best interest of these poor persons on whom it is risky to operate. Nor is ether the most suitable anæsthetic. This will be further reviewed under nitrous oxide and ethylene. Secondly, in empyema the use of ether is unwise, as it may cause an exacerbation of the lung disease and there is always the risk of pus breaking through into a bronchus. Nitrous oxide and oxygen, ethylene and oxygen or a local anæsthetic should be used. Quinine and urea hydrochloride as a local anæsthetic have the advantage of keeping the muscles insensitive for several days. Thirdly, in epithelioma of the tongue in which there is very much ulceration and sepsis. The introduction of the catheter may be difficult and the manœuvres with the laryngoscope or fingers may cause trauma and bleeding. In such a case it is safer to perform a laryngotomy, fit a large rubber tube over the laryngotomy tube and to this attach a funnel covered with cotton stockinet. Ether may be dropped on to this or the vapour may be pumped under the stockinet.

CASE XIX.—Record B197 of March 11, 1925. Mr. H., *ætatis* fifty-three, a patient of Dr. Newland at the North Adelaide Private Hospital, was suffering from a badly ulcerated carcinoma of the tongue which involved the lower jaw. He was anæsthetized, laryngotomy was performed and the ether continued through the tube. Half the tongue and lower jaw were removed followed by a block dissection of the neck.

*Anæsthesia by Colonic Oil-Ether Injection.*

The amount of detail in the method of colonic oil-ether injection has rendered it unpopular.[17] I have not used this method for four or five years, as the results obtained in other ways seem better. It increases the work of the nursing staff, is not under quick control and aspiration pneumonia is apt to occur owing to the long post-operative partial anæsthesia.

On several occasions at the Repatriation Hospital patients absolutely refused to undergo a second operation if they had to submit again to ether given by the rectal method.

*Gastric Administration of Ether.*

The method of giving ether by the stomach was used during the war and Burnell[18] reported on its use at Broken Hill. I have no experience of it.

*Ether by Intravenous Infusion and by Intramuscular Injection.*

I mention the use of ether by intravenous infusion and intramuscular injection only in order to condemn them.

**Carbon Dioxide in Anæsthesia.**

Pluger and Dohmen[19] in 1868 showed that excess of carbon dioxide in respired air excited the respiratory centre. Haldane[20] showed that 0·23% increases in the alveolar carbon dioxide gave 100% increase in the resting alveolar ventilation. Yandell Henderson[21] [22] has shown the advantages of increased pulmonary ventilation, obtained by this means, in the more rapid absorption of volatile substances.

Whitridge Davies states:[23]

Under normal circumstances the amount of air breathed by an adult of average size is approximately seven litres per minute. If, however, the inspired air contain 5% of carbon dioxide, the respiratory minute volume will be approximately thirty litres. This greatly increased amount of air breathed acts as a larger vehicle for the conveyance of normal or even increased amounts of ether to the lungs at concentrations much lower than those producing laryngeal spasm or pulmonary irritation.

When the simple apparatus described by Davies is used, carbon dioxide may be led by a rubber tube under the anæsthetic mask. The effect on the respiration is to cause much deeper breathing and a shortened induction period without laryngeal spasm or coughing. The amount of anæsthetic used is lessened.

CASE XX.—Record 724 of October 20, 1927. Mrs. C., *ætatis* forty-five, a patient of Dr. Newland at the Adelaide Hospital, suffered from gall stones. Before the anæsthetic was begun, her breathing was very shallow, as her hypodermic injection of morphine had been given over an hour previously. With the assistance of carbon dioxide full third-stage anæsthesia was obtained without excitement in two minutes forty-five seconds, only five cubic centimetres of ethyl chloride and twenty cubic centimetres of ether being required. An endotracheal catheter was passed and attached to Mott's apparatus, the usual few coughs occurred, respiration then became normal and the patient was ready for the surgeon in four minutes and forty-five seconds from the time that the first drop of ethyl chloride dropped on to the mask.

CASE XXI.—Record 705 of October 13, 1927. Mrs. M., *ætatis* forty-five, suffered from carcinoma of the breast. Induction required two minutes and thirty-five seconds, only four cubic centimetres of ethyl chloride and fifteen cubic centimetres of ether being used. An endotracheal

catheter was passed and the sterile towels were clipped on to the skin in five minutes from beginning the induction.

CASE XXII.—Record 704 of October 13, 1927. The patient was an old lady of seventy-three. Induction required two minutes and forty-five seconds, a change was then made to endotracheal administration of the anæsthetic and preparations were begun within five minutes.

### The Newer Gas Anæsthetics.

Nitrous oxide and oxygen and ethylene and oxygen are replacing ether as the anæsthetic of choice for many operations. They cause very little if any alteration in the bodily organs, unless some asphyxial element is present. Many experiments have been carried out, but no sign of injury has been found in the lungs, heart, liver, kidneys or nervous system. There is neither salivation nor irritation of the respiratory mucous membrane at any stage.

Induction is pleasant, recovery very rapid and usually without nausea or vomiting so that nourishment may be given almost immediately. The blood pressure is not depressed and consequently shock is much lessened. Nitrous oxide and ethylene are expensive in Australia, therefore these gases are at present most frequently used for patients who stand operation badly.

Ethylene and oxygen anæsthesia differs from that of nitrous oxide and oxygen in two main features. It allows a higher percentage of oxygen to be given and muscular relaxation is greater.

#### *Pre-operative Hypodermic Injection.*

Morphine 0·0075 gramme (one-eighth of a grain) and hyoscine 0·0003 gramme (one two-hundredth of a grain) should be given one and a half hours before operation and repeated three-quarters of an hour before operation.

#### *Gas Anæsthesia in Exophthalmic Goître.*

The surgical treatment of exophthalmic goître is becoming daily more frequent. There are many brilliant results, but the mortality is still considerable. By the use of the gas anæsthetics this mortality can be much reduced. This appears to have been first recognized by Crile[24] and his views have been confirmed by many observers.[25] I know of at least three deaths[26] after thyreoidectomy under ether and I feel sure that the patients would have recovered if the operation had been performed under nitrous oxide and oxygen. So strongly do I feel on this matter that I would say that the surgeon fails in his duty to his patient if he permits ether anæsthesia when operating on a patient suffering from severe toxic goître.

The next slide is the report on a patient that I was asked to see by Dr. Newland.

CASE XXIII.—Report of October 27, 1926. Miss McC., *ætatis* fifty-seven, was suffering from exophthalmic goître. On examination she cannot lie down comfortably unless propped up with several pillows. She coughs frequently and spits up mucus. She has six septic stumps which remain under the lower denture. Chronic inflammation is present in the tonsils. A few scattered râles are heard in the lungs. On examination of the heart an occasional extra beat is heard. The pulse rate is 96. The blood pressure is 174/88 millimetres of mercury. The urine is clear, its specific gravity is 1012, it is alkaline, phosphates appear when it is boiled. No albumin, sugar, acetone or diacetic acid are found. The pressure ratio is 97% (normal is 40% to 60%; safe is 25% to 75%). The energy index is 25 (normal is 13 to 20). Breath holding test gives figures 13, 19, 12 (normal is 30 to 40).

The conclusion is that this patient is at present unfit for any general anæsthetic for partial thyreoidectomy. Probably rest in bed and medical treatment will improve her condition sufficiently to allow nitrous oxide and oxygen anæsthesia to be administered for partial thyreoidectomy. It would be safe to allow nitrous oxide and oxygen for a few minutes for dental extractions and this would accustom the patient to the procedure. The high blood pressure will probably cause hæmorrhage to be free.

I examined her again on November 8 and reported: "Patient states that she feels better, coughs less frequently and that the goître feels smaller."

On examination the patient is less nervous than at the previous examination and coughs less. Of the teeth one of the stumps has come out and another is very loose. The heart's action is now quite regular. The pulse rate is 108. The blood pressure is 168/90 millimetres of mercury. The pressure ratio is 85% (an improvement of 12%). The energy index is 27 (two worse on account of increase in pulse rate). The breath holding test yields figures 28, 36, 35 (safety normal is 30 to 40).

The conclusion is that this patient is just fit enough for nitrous oxide and oxygen anæsthesia for partial thyreoidectomy, but the safety margin is very small. Probably there will still be a slight further improvement. It would be wise to avoid atropine in a pre-operative hypodermic injection on account of increasing the pulse rate and so increasing the work of the heart. Morphine with or without hyoscine should be given in divided doses one and a half and half an hour before the operation.

Operation was further deferred during the hot summer weather and did not take place till seven months later. The next slide is the record of the anæsthetic.

Blood Pressure Chart 616 of June 9, 1927. On coming into the theatre, the patient was in a restless condition owing to the hyoscine injection. There had been no previous hyoscine tolerance test. Nitrous oxide and oxygen were given and subtotal thyreoidectomy was performed. After a stormy period of twenty-four hours she made an excellent recovery.

CASE XXIV.—Blood Pressure Chart 568 of November 29, 1926.[27] Jane S., *ætatis* thirty-four, had an exophthalmic goître and was very toxic. Ethylene and oxygen were given while Dr. Lindon removed the left lobe of the thyreoid and ligatured the right superior thyreoid artery. The condition before operation was: Pulse rate, 180; blood pressure, 118 systolic and 80 diastolic. After operation the readings were: Pulse rate, 120; blood pressure, 112 systolic and 78 diastolic.

She recovered consciousness in three minutes, vomited once and was able to take a drink immediately she returned to bed.

#### *Gas Anæsthesia in Serious Conditions.*

Any patient for whom general anæsthesia is risky, may be anæsthetized with the gas anæsthetics with comparative safety. I have endeavoured to group the following records according to disability, but the majority of the patients had several.

In diabetes nitrous oxide causes no acidosis.

CASE XXV.—Record 258 of April 10, 1927. Mr. M., *ætatis* seventy-one, a patient of Dr. Wall, had an enormous carbuncle on the back of his neck. In spite of one hundred units of "Insulin" per day his urine still contained sugar, acetone and diacetic acid. Under nitrous oxide and oxygen anæsthesia the carbuncle was excised and he made a very good recovery.

CASE XXVI.—Record B903 of November 9, 1925. Mrs. S., *ætatis* fifty-eight, a patient of Dr. Rupert Magarey, was one of the patients whom in my experience it was most risky to anæsthetize. She had diabetes with a blood

sugar content of 0·22, she had myxœdema, was an alcoholic and was suffering from extreme anæmia caused by hæmorrhage from carcinoma of the body of the uterus. Nitrous oxide and oxygen were given while the uterus was curetted and nitric acid applied. This procedure stopped the hæmorrhage and allowed the patient to recover sufficiently for a hysterectomy to be performed at a later date as shown in the next slide.

Blood Pressure Chart 451 of January 19, 1926. Abdominal hysterectomy was performed by Dr. Newland and very little shock was caused, but the patient died nineteen hours later.

The explanation of this is found in the following quotation.

I feel sure that many old people die, not from shock, as frequently asserted, but simply because they have what Mackenzie defines as a limitation of cardiac response. The operation calls for an extra effort from a cardio-sclerotic heart, to which it is unable to respond, and a sudden inception of the nodal rhythm is brought about which, in my opinion, not infrequently is the cause of death.[28]

CASE XXVII.—Blood Pressure Chart 524 of August 17, 1926. Mr. L., *ætatis* sixty-five, a patient of Dr. Newland, suffered from diabetes, auricular fibrillation and an enlarged prostate. Cystotomy was performed under local anæsthesia by eucaine after which the prostate was removed under nitrous oxide and oxygen anæsthesia. Recovery was uneventful.

In lung complications nitrous oxide causes no respiratory irritation.

CASE XXVIII.—Blood Pressure Chart 500 of May 30, 1926. Mr. H., *ætatis* eighty, a patient of Dr. Ken Bollen, had an appendix abscess complicated by bronchitis, nephritis and aortic regurgitation. Nitrous oxide and oxygen anæsthesia allowed the appendix abscess to be drained and the patient recovered and is still alive two years later.

CASE XXIX.—Record X566 of July 13, 1926. Miss McE., *ætatis* fourteen, a patient of Dr. Malcolm Scott, had an empyema and was very cyanosed. Consolidation was present over the whole of one lung and most of the other one. Nitrous oxide with 20% of oxygen allowed the resection of a rib and drainage of the empyema. A good recovery followed.

CASE XXX.—Blood Pressure Chart 355 of April 28, 1925. Mrs. S., *ætatis* sixty, a patient of Dr. P. Rice, had an empyema of the gall bladder complicated by bronchitis and recent acute nephritis. Six cubic centimetres of ether had to be added to the nitrous oxide and oxygen in order to obtain proper relaxation while a cholecystostomy was performed. Twelve minutes after the operation the patient was fully conscious. There was no exacerbation of the lung condition and recovery was rapid.

CASE XXXI.—Record 587 of August 19, 1927. Mr. L., *ætatis* twenty-one, a patient of Dr. Lindon, was suffering from a pyopneumothorax with much cough and sputum. He was very emaciated and required the support of three large pillows in order to breathe. Nitrous oxide and oxygen anæsthesia allowed the resection of two ribs without abolishing the cough reflex and quite 180 cubic centimetres (six ounces) of pus were coughed up during the operation, under any other general anæsthetic he would have been drowned by his own pus. Two minutes after the operation he was able to sit up on the operating table and hold a bowl into which he coughed and spat more pus.

CASE XXXII.—Blood Pressure Chart 362 of May 9, 1925. Mrs. H., *ætatis* twenty-eight, a patient of Dr. P. Rice, suffered from pulmonary tuberculosis of both lungs complicated by abdominal pain and pyrexia which was uninfluenced by rest. Nitrous oxide and oxygen with a little ether allowed the removal of tuberculous Fallopian tubes and the appendix. Recovery was rapid and Dr. Rice informs me that she is still in good health after nearly three years.

CASE XXXIII.—Blood Pressure Chart 588 of February 28, 1927. Michael G., *ætatis* seventy-four, a patient of Dr. Lindon, was a very emaciated man with a severe cough complicating enlargement of the prostate. Ehtylene and oxygen were administered by the Heidbrink apparatus while the prostate was removed. Consciousness was regained one minute after the operation was completed.

CASE XXXIV.—Record 666 of September 26, 1927. F.A.S., *ætatis* sixty-nine, a patient of Dr. Jose, was a feeble old man suffering from an epithelioma of the floor of the mouth involving the lower jaw. He had considerable auricular fibrillation and crepitations at both bases. Nitrous oxide and oxygen with ether were administered and an endotracheal catheter was inserted, a return air tube being attached. This procedure was rather difficult as the laryngoscope light failed and the mask had to be reapplied. Nitrous oxide and oxygen with ether were continued through the tube after the pharynx had been packed. The growth with part of the lower jaw was excised. Consciousness was quickly regained after the operation and no exacerbation of his lung condition occurred.

Exophthalmic goître as a complication is illustrated in the following case:

CASE XXXV.—Blood Pressure Chart 349 of April 11, 1925. Mrs. S., *ætatis* thirty-four, was a patient of Dr. C. Bollen; she had an ectopic gestation and also exophthalmic goître and was very seriously ill. Nitrous oxide and oxygen with a little ether were administered and Marshall's apparatus was used. The Fallopian tube was resected without any appreciable shock and the patient made a good recovery.

The anæsthetization of patients *in extremis* when operation offers the only chance of recovery is illustrated in the following cases:

CASE XXXVI.—Blood Pressure Chart 619 of June 18, 1927. Mrs. C., *ætatis* thirty-five, a patient of Dr. Brian Swift, had a streptococcal peritonitis and probably some involvement of the base of both lungs. Her pulse rate was 144, respirations numbered 36 and the blood pressure was 90 millimetres of mercury systolic and 60 diastolic. Morphine had been injected so that her real condition was worse than shown by these figures. Under nitrous oxide and oxygen a posterior colpotomy was performed and pus evacuated. Within one minute of the termination of the anæsthetic the patient was able to speak. Unfortunately the heart began to fail some fourteen hours later and she died.

CASE XXXVII.—Blood Pressure Chart 618 of June 16, 1927. E.M., *ætatis* thirty-five, a patient of Dr. John Verco, had been operated upon for an appendix abscess and after a few days began to go down hill. It was decided to explore the wound in the hope of finding another abscess. Intravenous saline infusion had been required on the previous night. The man was extremely toxic, cyanosed, cold and vomiting frequently. His pulse rate was 134. Respiration rate was 40, blood pressure was 84 systolic and 56 diastolic; his pupils were dilated. Nitrous oxide was given with a high percentage of oxygen and the wound explored. The patient was so ill that on two occasions the assistant inquired whether the man was still alive. Consciousness was recovered within five minutes and the patient was able to talk. Death took place seven hours later, but I do not think that it was accelerated by either anæsthetic or operation.

CASE XXXVIII.—Blood Pressure Chart 517 of July 26, 1926.[29] Mrs. L.M., *ætatis* sixty-three, was a very emaciated woman, suffering from carcinoma of the pylorus, with constant vomiting and pronounced acetonuria; she was practically dying. Anæsthesia with ethylene and oxygen required two minutes. A gastro-enterostomy was performed in twenty-six minutes by Dr. Newland and consciousness was regained one minute later. I am convinced that ether anæsthesia would have been fatal in this case.

### Spinal Anæsthesia.

Spinal anæsthesia is regaining popularity, especially with urologists and gynæcologists. The muscular relaxation obtained is more complete than

with any other anæsthetic. The mortality rate is unfortunately too high for indiscriminate use, but exact figures are difficult to obtain. Miller collected records of 68 deaths in 38,000 cases or 1 in 556.[30] Jonnescu records 11,000 operations with only 2 deaths.[31] Strauss[32] in a collective statistic of 30,000 cases places the mortality at 1 in 3,000. Coleman[33] reports 5,000 cases without a death. The contraindications to spinal anæsthesia are low blood pressure, disease of the spinal cord or meninges, septicæmia, syphilis and tuberculosis.

There is always some fall of blood pressure and the amount may sometimes be alarming.

The following four records will show examples of both slight and big depressions.

CASE XXXIX.—Blood Pressure Chart 194 of October 4, 1923. J.J., *ætatis* sixty-four, a patient of Dr. Newland, was suffering from diabetic gangrene and even after treatment with "Insulin" and diet still had sugar, acetone and diacetic acid in the urine. Under spinal anæsthesia, by "Stovaine billon" the right leg was amputated through the thigh. Before operation the pulse rate was 128 and the blood pressure 118 systolic and 58 diastolic. After operation the pulse rate was 130 and the blood pressure 100 systolic and 62 diastolic. The systolic fall is usually more than the diastolic.

CASE XL.—Blood Pressure Chart 622 of July 6, 1927. Edward W., *ætatis* seventy-eight, a patient of Dr. Newland, was suffering from senile gangrene of the foot. Under spinal anæsthesia of "Stovaine billon" the leg was amputated through the thigh. In this case the pulse rate increased from 84 to 120 and later fell to 108. The systolic blood pressure fell from 138 to 92, but afterwards recovered to 112, while the diastolic blood pressure fell from 88 to 58 and then recovered to 75.

CASE XLI.—Blood Pressure Chart 242 of May 5, 1924. Mrs. M.B., *ætatis* sixty-four, a patient of Dr. Newland, was a frail old woman with a conical stump following amputation of the right leg for diabetic gangrene. Under spinal anæsthesia of 5% "Stovaine" and glucose the leg was reamputated. The pulse rate was not much altered, but the systolic blood pressure fell from 190 to 60 and the diastolic blood pressure from 100 to 40. An intramuscular injection of one cubic centimetre of pituitary extract was given and the pressures recovered to 100 and 60 respectively.

This record demonstrates that the very high blood pressure falls much more than the medium one under spinal anæsthesia.

CASE XLII.—Blood Pressure Chart 614 of June 2, 1927. John S., *ætatis* sixty-nine, suffering from a uretheral stricture and perineal fistula, was given a spinal injection of 1·5 cubic centimetres of "Stovaine billon" and anæsthesia was good in five minutes. Dr. Newland excised the stricture by Hamilton Russell's method. Before the operation the pulse was 120 and blood pressure 140 millimetres of mercury systolic and 98 diastolic. Probably the patient was moved too soon, but the result was rather terrifying, the blood pressure fell rapidly to 40 systolic and 25 diastolic; the patient went grey, had air hunger and sweated. Restoratives raised the blood pressure to 60 systolic and 40 diastolic by the end of the operation and the patient was hurried back to bed. Rectal injection of saline solution, raising the foot of the bed and the "shock cradle" brought him into good condition in an hour and he made a good recovery. He was, however, troubled with severe headache for several days and had pains in his legs for some weeks.

Spinal anæsthesia should not be employed unless frequent blood pressure readings are taken throughout the operation.[34] [35] Also restoratives, including carbon dioxide, should be in readiness. Most of the difficulties that have occurred, have been from faulty choice of patient or from errors in technique.

Wehrhein[36] states that the severe fall of blood pressure may be avoided by subcutaneous injection of fifty milligrammes of ephedrine five minutes before the spinal anæsthesia is begun.

### Sacral or Caudal Anæsthesia.

Caudal anæsthesia is obtained by the injection of a local anæsthetic through the sacral hiatus into the caudal canal. The solution is extradural and consequently has not the drawbacks of spinal anæsthesia. It is used chiefly for operations on the anus, vagina or bladder. In America it has been used considerably for midwifery. Oldham[37] reported 500 cases with 85% to 90% success. The technique of injection is as follows:

The patient lies comfortably on the side with the thighs slightly flexed and the back rounded. The skin and anæsthetist's hands are cleansed as for any other surgical operation. With the left forefinger the sacral hiatus is defined by feeling the depression between the cornua of the sacrum. A few drops of 1% "Novocain" are injected into the skin. Then a needle, at least five centimetres (two inches) in length, is pushed through the injected skin for about 1·25 centimetres (half an inch) when the membrane covering the hiatus will be pierced. The shaft of the needle is then lowered until it lies in the axis of the sacral canal and is pushed upwards about 3·75 centimetres (one and a half inches). If no blood comes from the needle, a syringe is attached and the solution of 1% or 1·5% "Novocain" is slowly injected. The caudal canal varies much in size and consequently the amount of solution required varies. Anæsthesia of the perineum is the guide to the amount required which is seldom less than twenty cubic centimetres and may be much more. The maximum amount that may be used is the equivalent of 100 cubic centimetres of 1% solution (one gramme of the salt) to 45 kilograms (100 pounds) of body weight.[38]

The following three cases will illustrate the type of case and the results obtained.

CASE XLIII.—Record 857 of December 8, 1927. T.B. was a very feeble old man suffering from an enlarged prostate and cardiac disease. Caudal anæsthesia required 45 cubic centimetres of a 1·5% solution of "Novocain." Then the abdominal wall was infiltrated. Dr. Newland removed the prostate suprapubically without pain being felt. There was hardly any shock.

CASE XLIV.—Record X872 of November 4, 1926. John T., *ætatis* forty-three, weighed 123 kilograms (sixteen stone five pounds) and was said to be the largest man in the British Navy. Sacral anæsthesia with 30 cubic centimetres of 1·5% "Novocain" permitted cystoscopy and catheterization of the ureters for twenty-five minutes without any pain.

CASE XLV.—Record X978 of December 13, 1926. A.B., *ætatis* forty-one, a very emaciated man, was suffering from active pulmonary tuberculosis of both lungs and a very large tuberculous ischio-rectal abscess. Caudal anæsthesia was employed and 35 cubic centimetres of 1·5% "Novocain" were injected. This amount was not quite sufficient as slight pain was felt in the upper part. However, the anæsthesia allowed very thorough incision and curettage of the abscess cavity.

The views expressed in this paper apply to South Australia in the early part of 1928. They will probably undergo change from time to time as new drugs and new methods are introduced.

### Conclusions.

1. Each anæsthetic has its own sphere of usefulness, as have the different forms of administering it.

2. Good anæsthesia enables the surgeon to perform the operation more easily and with less risk to the patient.

3. Faulty choice of anæsthetic may prevent or retard the recovery of the patient.

4. The patient has a right to expect the use of the safest and most comfortable form of anæsthesia.

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## Reports of Cases.

### AN UNUSUAL GALL-BLADDER CONDITION.

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A MALE patient, thirty-nine years of age, was recently sent to me by Dr. Balfour Wishart for a cholecystographic examination, having been referred to him by Dr. J. L. Whitworth.

The patient's history was one of attacks of indigestion off and on for years. Twelve days before I saw him he was seized by sudden acute pain in the right epigastric region, extending over the upper part of the abdomen. It was deep and boring. Reaching a maximum, it was relieved by vomiting, but returned intermittently. There was considerable progressive jaundice and the patient became "sore" over the gall-bladder area. There was no shoulder pain.

Initial films of the gall-bladder region were taken prior to the projected oral administration of capsules of sodium tetraiodo-phenolphthalein. The result shows how advisable it is to adopt such a procedure.

The developed films gave an unexpected result. It is demonstrated in the accompanying illustrations.

A gall-bladder shadow of extreme density presented itself. It was of normal size and contour and of uniform radiopacity except that this was increased at the base. It resembled, in fact, a super-cholecystogram. The shadow was actually more intense than that of the adjacent spinal column, and many times greater than that of any cholecystogram.

After removal the viscus was found to be filled with a thick greenish mud. According to a report from the Walter and Eliza Hall Institute the contents consisted

of cholesterol-calcium carbonate and phosphate. A skiagram of the organ taken just before it was opened showed a uniform opacity with a dozen or more minute denser particles scattered throughout. It was evidently the agglomeration of these at the lower pole of the gall bladder in the erect posture assumed by the patient that gave the extra basal density in the skiagrams.

This is the only case of the kind that I have met, nor have I seen any intermediate stages between this extremely dense shadow and the faintly perceptible ones occasionally detected.

I am indebted to Mr. C. J. O. Brown for directing me to the only reference bearing on this subject I have come across in the literature of gall-bladder pathology. Dr. J. L. Brailsford[1] in a discussion on cholecystography emphasizes the need for preliminary radiograms, as they may reveal gall stones, and writes: "But more important still are those cases in which the gall-bladder is filled with stone either formed or in the condition of sand, the radiographs of which are almost identical with normal cholecystographs." He states he had seen two such instances.

It will be noted, however, in the case here reported that as already stated the density of the gall-bladder shadow was much more intense than is ever seen in a cholecystogram.

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## AN ABNORMAL EARLY UTERINE PREGNANCY.

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AND
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THE ovum which forms the subject of these notes, was obtained by one of us (J. B. Dawson) as the result of a curettage of a woman for irregular bleeding. Amongst the material obtained was a larger fragment which suggested the presence of an early embryo. The piece was fixed in formalin and a frozen section, prepared in the pathological department of the Adelaide Hospital, confirmed this opinion. Since there was now good reason to believe that the fragment contained a very early human pregnancy and would therefore be of great interest, what remained (for unfortunately some of it had been lost in this preliminary examination) was brought to the anatomical department for more complete preparation. The material proved to be excellently preserved and serial sections 8 $\mu$ thick were prepared, save for the part that had been used in taking off the frozen sections.

### Clinical History and Age of the Ovum.

The patient from whom this specimen was obtained, was thirty-eight years of age and had been married for eighteen years. The youngest of her three children was nine years old. Since the birth of her youngest child she had had five miscarriages. For five months prior to admission, on March 20, 1928, she had menstruated irregularly, the intermenstrual and intramenstrual periods varying considerably and without apparent rhythm. For the three weeks immediately before coming under observation she had had a daily but varying loss of blood from the uterus, accompanied by some pain in the right iliac fossa.

A diagnosis of incomplete abortion was made and the patient's uterus was curetted on March 21, 1928. An unusually large and peculiar piece of endometrium was removed. This fragment was found to contain embedded in the thickened mucosa a small ovoid cyst-like body, paler than the surrounding endometrium, which projected from the surface and measured *in situ* prior to fixation approximately six by four millimetres.

The uterine bleeding and abdominal pain subsequent to fertilization may possibly be explained by the fact that the patient was later discovered to have a right-sided salpingitis.

Careful inquiry fixed the date of her last true menstrual period at thirty-one days prior to admission. Making the now usual allowance for the fact that ovulation occurs at the middle of the intermenstrual period, the probable duration of the pregnancy would be about twenty days on admission. The operator was at once struck by the resemblance of the fragment to the photographs of the Bryce-Teacher ovum.

The chorionic vesicle, after fixation, in its greatest diameters measured 3·5 by 3·6 by 3·9 millimetres. This size would make it older than the Peter's ovum and in fact, when compared with the size and estimated age of the ova in the table of Bryce and Teacher, it would fall in the group from 16 to 20 days old. The calculation of the age from size and differentiation of the chorionic vesicle must be uncertain since the pregnancy is abnormal.

### Description of the Pregnancy.

The *decidua* present in the fragment shows a considerable engorgement of all the blood vessels present. Glands are dilated and mostly filled with coagulated material. Some contain blood and in one case there is a massive distension of a gland with blood. There is considerable infiltration of the stroma with round cells. Decidual cells are present in abundance. Extravasated blood occurs in the stroma and there are two areas in which there is necrosis of the uterine tissue. These are adjacent to the place where it is probable the ovum entered. Bordering the chorionic vesicle there is a fibrous reaction forming a capsule several strands thick. This is permeated with round cells. On the side towards the chorionic vesicle this fibrous layer is lined with a basal ectoderm, not complete everywhere, but in places forming a lining one cell thick, such as has been described by other observers.

The ovum consists of a number of vesicles of varying size, the largest, which may have contained the embryo, being 1·25 millimetres long. The majority is smaller, the average size being 0·3 millimetres. These vesicles are covered by Langhans's cyto-trophoblastic layer which again is covered by the syncytio-trophoblast. This outer syncytial layer in some places covers the cyto-trophoblast with the thickness of one cell only. Elsewhere it has shown considerable proliferation and forms clumps of cells either attached to the surface of the villus or so cut that they form a rounded mass or a cell column. The behaviour of the epithelium is such as to suggest that the activity is neither more nor less than normal.

A vast extravasation of blood surrounds the villi. For the most part fibrin is absent, but at one place coagulation has occurred. The hæmorrhage is so abundant as to give the impression that the blastocyst was about to be dislodged and spontaneous abortion to occur. The blood forms a continuous mass. The amount that has been enclosed by the formation of intervillous spaces is only trifling, yet such has occurred in a few places.

The most striking feature of the ovum is the large size of the villi and the fewness of their number. In the sections where the ovum is largest there are only nine. The size of the villi is due to the proliferation of the connective tissue stroma. This stroma should be at the stage of this ovum a delicate and scanty connective tissue, but it is abundant, not very cellular, shows fibrous change and perhaps hyaline degeneration. No spaces or blood capillaries are present in the stroma. It is believed that the villi are undergoing the preliminary changes that lead to the formation of the hydatidiform mole. Though the sections at our disposal are not wholly complete, examination of them and of the remainder which were cut as frozen sections, reveals no indication of the presence of a fœtus.

From this examination we conclude that this early uterine pregnancy was undergoing hydatidiform degeneration. Since from the menstrual age and the size of the ovum we believe the pregnancy to be of some twenty days'

## ILLUSTRATIONS TO THE ARTICLE BY DR. C. J. O. BROWN.

FIGURE I.

CASE XII.—This picture was taken on February 13, 1920; some slight irregularity is seen in the neck on the diaphyseal side of the epiphyseal line.

FIGURE II.

CASE XII.—This picture was taken on June 24, 1921; there is a large cavity in the neck with clean cut edges resembling a bone cyst.

FIGURE III.

CASE XII.—This picture was taken on September 19, 1922; the cavity is becoming obliterated and bone recalcified. The joint was not involved at any stage. The hip is now normal.

FIGURE IV.

CASE XIII.—There is a typical tuberculous cavity on the diaphyseal side of the epiphyseal line. Recovery occurred without joint involvement. The hip is now normal.

## ILLUSTRATIONS TO THE ARTICLE BY DR. C. J. O. BROWN.

FIGURE V.
CASE XVII.—This picture was taken on February 15, 1925. There is typical diffuse tuberculous arthritis with upward subluxation. Calcification and healing are evident.

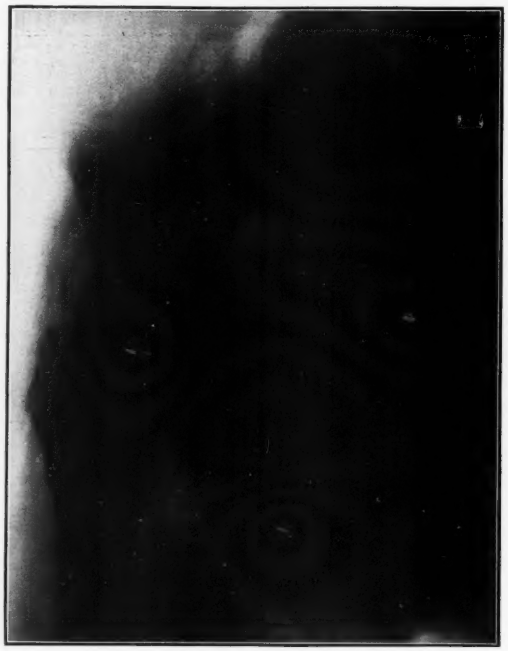

FIGURE VI.
CASE XVII.—This picture was taken on January 4, 1928. There is cure with bony ankylosis. Continuity of trabeculæ from ilium to femur can be seen.

FIGURE VII.
CASE XVIII.—This picture was taken on June 8, 1926. There is tuberculous arthritis with superficial erosion of the articular surfaces.

FIGURE VIII.
CASE XVIII.—This picture was taken on February 14, 1928. There is cure with bony ankylosis.

## ILLUSTRATIONS TO THE ARTICLE BY DR. C. J. O. BROWN.

FIGURE IX.
CASE XXIII.—This picture was taken on February 1, 1923. There is a large well marked cavity in the neck of the femur with involvement of the articular surfaces. This and Figure X should be compared with Figures I, II and III.

FIGURE X.
CASE XXIII.—This picture was taken on August 13, 1927. There is cure with bony ankylosis.

## ILLUSTRATIONS TO THE ARTICLE BY PROFESSOR H. WOOLLARD AND DR. J. B. DAWSON.

FIGURE I.
A Low Power Microphotograph of the Ovum. The straight edge is the line from which the frozen sections were cut. The villi are surrounded by blood and embedded in the fragment of endometrium.

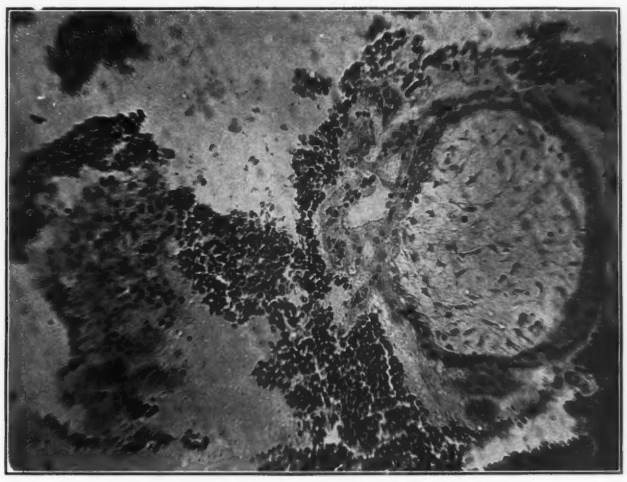

FIGURE II.
A High Power Microphotograph of a Villus. The two layers of trophoblast and the hypertrophy of the stroma are visible. The cells of the stroma (Hofbauer cells) are conspicuous. The surrounding blood and irregular masses of syncytio-trophoblast are also seen.

## ILLUSTRATIONS TO THE ARTICLE BY DR. K. STUART CROSS.

FIGURE I.
Showing Antero-Inferior Oblique View of Gall Bladder.

FIGURE II.
Showing Left Antero-Lateral Oblique View of Gall Bladder.

## ILLUSTRATIONS TO THE ARTICLE BY DR. P. L. HIPSLEY.

FIGURE I.
Showing Condition on Admission.

FIGURE II.
Showing Condition on Second X Ray Examination.

duration, this calculation makes hydatidiform degeneration an extremely early event in pregnancy. Mall, in an exhaustive account of hydatidiform degeneration, quotes the investigation of Gierse who described such degeneration in a chorionic vesicle measuring twelve millimetres.

### Discussion.

Such an early case as this is therefore of some interest in the analysis of the pathology of the ovum. Hydatidiform degeneration has usually been regarded as a rare and late event in pregnancy. Both these points were challenged by Mall who brought forward considerable evidence to prove that it was a much earlier and commoner event than had been supposed. From an analysis of several thousand ova he concluded that hydatidiform degeneration occurred most frequently about two and a half months after conception. Instead of accepting a figure of about one in two thousand pregnancies, he suggested that hydatidiform degeneration occurred in about 4% of all pregnancies and in 10% of pathological pregnancies. Moreover, he quotes with approval those investigators who would place the time of onset of this kind of degeneration still earlier.

There are at least four theories proposed to account for this condition. Abnormal proliferative activity on the part of the epithelial layers of the trophoblast has been considered a most important factor ever since the work of Marchand on chorio-epithelioma. Mall's observations do not support this view and he records the great variability of the activity of the epithelium in different parts of the chorion. This present study is in accordance with the view of Mall that there is nothing unusual in the activity of the epithelium in hydatidiform degeneration.

Again it has been supposed that the fœtus in some way regulates the activity of the epithelium. Though there is much to be said for this as a general conception, yet the facts of molar degeneration do not support it, for fœtuses well advanced in development or even living may be obtained from such cases. Despite this, however, the fœtus is usually dead and may be entirely absent or reduced to a mere nodular remnant. It is to be remembered that the degeneration varies in the time of onset and all gradations from normal villi to complete liquefaction have been observed. The entire absence of the embryo in this case at such an early age rather supports than otherwise the idea that the cause may lie in the abnormality of the embryo itself. Mall's observation of the more frequent occurrence in tubal pregnancies of hydatidiform degeneration has been regarded as a good argument against the defective ovum theory, for it would require some credulity to believe that more abnormal ova became implanted in the tube than in the uterine cavity. A different interpretation of this fact is, however, possible. For the unusual implantation might first affect the embryo and this in turn lead to degeneration of the villi.

The absence of capillaries from the stroma of the villi has been the most important observation made on moles up till now. It is true that in the present case no capillaries are present in the villi, but they do not appear until later, after the formation of the intervillous lacunæ. Intervillous lacunæ are just in evidence in this case and no intravillous capillaries are to be expected in so early a pregnancy as this. It is therefore possible to conclude from this case that degeneration or absence of villous capillaries is not the primary cause of hydatidiform degeneration.

Mall has pressed the view that the pathology of the ovum is primarily a question of faulty implantation and the most important cause of this is chronic inflammation of the *decidua*. The criteria of what constitutes the milder degrees of chronic endometritis are difficult, but from a study of the *decidua* present it seems to us that there is no reason to suppose that such is present in this case.

Giacomini, according to Mall, was the first to show that the best indication of the abnormality of an ovum was the undue hypertrophy of the mesodermal tissue. Such mesodermal hypertrophy is the most striking impression obtained from a study of this specimen. Observation in this case excludes both the abnormal activity of the epithelium and chronic inflammation as primary factors in bringing this about. The age of the specimen finally shows that capillary degeneration cannot be a primary cause. Since on other grounds reasons have been forthcoming for regarding the embryo as possessing a regulative action on the formation and function of the villi, we suggest that the cause lies in the abnormality of the embryo itself.

### Summary.

1. An abnormal uterine pregnancy of about twenty days' duration, and 3·6 by 3·5 by 3·9 millimetres in size is described.

2. The embryo is absent, the epithelial proliferation is normal, but the villi are enlarged by the hypertrophy of the stroma.

3. The cause of this hypertrophy is not due to changes in the villous capillaries, for these have not yet appeared.

4. The *decidua* does not show chronic endometritis.

5. It is suggested that the cause of hydatidiform degeneration is to be found in the regulative control exerted by the embryo on the formation and function of the villi.

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(3) F. P. Mall: "The Human Magna Réticulé in Normal and Pathological Development," "Contributions to Embryology," Numbers 10 to 19, Volumes 4 to 6, 1916.

(4) F. P. Mall and A. W. Meyer: "Studies on Abortuses: A Study of Pathologic Ova in the Carnegie Embryological Collection," "Contributions to Embryology," Number 56, Volume 12, 1921.

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## STRICTURE OF THE ŒSOPHAGUS.

By P. L. HIPSLEY, M.D. (Sydney), F.C.S.A.,

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A FEMALE child, aged three years, was admitted to the Royal Alexandra Hospital for Children on February 3, 1925. The history given was that she had begun to vomit three days after birth. Vomiting was of the expulsive type. It had persisted for three years. She had been under treatment for pyloric stenosis; she had been given medicine including belladonna and her stomach had been washed out with no permanent result.

On admission she weighed 6·75 kilograms (fifteen pounds), was exceedingly emaciated, pale and listless and vomited fluids almost in the act of swallowing. All the systems appeared to be normal. No pyloric waves could be seen, nor could any tumour be felt in the region of the stomach, though all the viscera were easily palpable through the lax abdominal wall.

An X ray examination was made two days after the patient's admission. After the administration of one teaspoonful of opaque cream an obstruction was seen to exist about five centimetres (two inches) above the level of the diaphragm. Above this there was some dilatation of the œsophagus, but its extent was not determined (see Figure I on special plate). On the afternoon of February 5, 1925, the operation of gastrostomy was performed. The stomach was found to be much smaller than normal. Nourishment was subsequently given through the gastrostomy tube and the child steadily increased in weight. Three days after the operation both parotid glands increased considerably in size, became tense and shiny, but did not appear to be tender, although there was a slight rise in temperature to 37·2° C. (98·9° F.). With the general improvement it was found that the child could take food by the mouth without vomiting and on March 9, 1925, it was reported that she was taking readily by the mouth such food as porridge. A few days later she was eating biscuits and drinking cocoa; her weight was 7·5 kilograms (sixteen and three-quarter pounds).

On March 19, 1925, a second X ray examination was made and the radiologist reported a narrowing at the lower end of the œsophagus which in his opinion might be due to spasm (see Figure II on special plate).

On April 16, 1925, the child weighed 9·5 kilograms (twenty-one pounds) and was taking bread and butter and potatoes and mince meat by mouth.

# Reviews.

## A BOOK ON DIET.

"THE NORMAL DIET," by W. D. Sansum, Director of a Metabolic Clinic in California, is written primarily for patients, but is also directed to their medical attendants.[1] It is written in a readable style and is not too technical to be beyond the understanding of a layman who does not object to concentrate. On the whole the subject matter is orthodox, but there is more than a sprinkling of beliefs expressed which are not entirely in step with current scientific knowledge. He considers that high blood pressure is caused by too high a proportion of foods which leave a residue of acid reaction, but certainly admits that the experiments on a few dozen rabbits are not sufficient proof of his belief. He is careful not to stress his opinions without the preliminary use of the phrase "I believe" and such beliefs will be accepted critically. This book is to be recommended to medical practitioners; in it they will find many stimulating suggestions and a very clearly expressed summary of dietetics. In the early chapters will be found ten daily diet menus for: (i) Normal use, (ii) patients suffering from acid-ash acidosis, (iii) patients desiring to reduce weight with safety. The normal diet menus will provide on the average thirty-four calories per kilogram for a person weighing seventy kilograms, which most textbooks would describe as somewhat low; but it is probably sufficient for Southern California where Sansum's clinic is situated.

The author insists in Chapter II on sufficient bulk in the diet through the use of fairly large quantities of fruits and green leaf vegetables. In this chapter he also points out that the greater part of the waste products are not excreted in the fæces until three days have elapsed from the ingestion of the food from which they are derived. He cites the experiments of Alvarez and Friedlander with glass beads and of Burnett with millet seeds as evidence of this statement.

On page 29 he describes the development of the habit of the regular use of purgatives. The individual who takes insufficient quantities of foods which leave an indigestible residue, having become constipated, takes a drastic cathartic and empties the greater part of the bowels. This emptying tends to prevent a normal sized stool on the next day or even the day after. Having been taught that a daily action of the bowels is necessary to health he takes another purgative, probably a more drastic one and the vicious cycle is continued ever after. These repeated purgations have an irritating effect on the bowel and colicky pains and even entero-colitis may develope.

In Chapter II he describes "the acid-ash type of acidosis" and states that its symptoms include "malaise, lassitude, nausea, anorexia, headache, sleeplessness, muscle aches, acid mouth, sour stomach, acid urine and, I believe, the blood vessel disease which is responsible for blood pressure." This formidable list of symptoms calls to mind the list of the advertising quack. Considering that lima bean is the food which leaves the most alkaline ash, the author has arranged for the Lima Bean Growers' Association of Oxnard, California, to develope a flour from it which may be mixed with the acid-producing wheat flour. He considers that the effect of alkalis, such as sodium bicarbonate, which are so widely used both by the medical profession and by the layman, is to correct the acid-ash acidosis so prevalent in western communities.

On page 41 he states: "I believe that the urine passed should be nearly neutral or about twice as acid as the body" and so important does he consider this approximation to neutral reaction of the urine, that in the appendix he goes into full detail as to how to test the reaction. He advises the use of brom thymol blue and methyl red instead of litmus paper and writes: "I believe that a urine which is acid enough to turn blue litmus paper to red is far too acid and a urine which is alkaline enough to change red litmus paper to blue is probably too alkaline."

In the fourth chapter the author rightly emphasizes the importance of giving carbohydrates to correct the acetone type of acidosis, so common in childish complaints, where there is a reduction in food intake either with or without pyrexia. He advises fruit juices for this purpose, even lemon juice, because of the alkaline reaction of the ash; he states that when vomiting occurs, sour drinks are usually retained more readily. Again in this chapter he states that pregnant women are usually advised to eliminate starches and sugars when they should be advised to eliminate nearly all the fats.

In the chapter on the caloric requirements of the body which is very well written, there occurs the statement: "I believe that many conditions such as urticaria, hives, eczema and food asthma are due to the absorption of incompletely digested proteins. The exclusion of such proteins from the diet usually gives only temporary relief because the patient soon becomes sensitive to other proteins. I usually try out digestive help first" (enteric coated pancreatin tablets).

In discussing the mineral requirements of the body he states: "I advise the use of one quart of milk per day for all, young and old." He considers that the dental caries, so common in pregnancy, is due to the deficiency of calcium in the diet usually taken by adults. He reminds us that the constituents of animal foods depend on the substances contained in the plants on which the animals feed; this especially applies to their calcium and iron content. It is wise to see that an excess rather than a deficiency of milk is taken in order to guard against a possible deficiency in the food supplied in the dairy. If this quantity of milk is taken, less protein in the form of meat (which leaves an acid ash) need be taken.

It may be gathered from the foregoing that this small book is almost entirely original in conception; the opinions mentioned are scattered throughout a very clearly expressed description of the normal diet in practically all its phases.

[1] "The Normal Diet," by W. D. Sansum, M.S., M.D., F.A.C.P.; Second Edition; 1927. St. Louis: The C. V. Mosby Company: Melbourne: Stirling and Company. Post 8vo., pp. 166. Price: $1.50 net.

## TEACHING THE TUBERCULOUS PATIENT TO BECOME HIS OWN PHYSICIAN.

ANOTHER booklet of self-help for the tuberculous patient has appeared. This one is an English translation of Dr. Jacquerod's handbook for his sanatorium patients at Leysin, Switzerland.[1] In a space of some seventy pages the author gives much useful information and advice on the nature and treatment of tuberculosis, the latter, of course, mainly from a sanatorium point of view. Hygiene, diet, rest and work are adequately dealt with, though sometimes the outlook is a little foreign and some rules are suitable only for an Alpine climate.

Health education is apparently more advanced in Switzerland than in Australia, as "no one would dream of being shocked, nowadays, at the sight of someone using a pocket sputum flask in the train or the street." We believe this would be an infallible method in this country of reserving a compartment to oneself!

We would quarrel with the author's statement that relapses are less serious and can be easily cured. Nor can we accept his dictum that a temperature of 37·2° C. (99° F.) in the mouth is normal. Dr. Jacquerod might be suspected of speaking with tongue in cheek when he places a limit of altitude for tuberculous patients at 4,500 feet. Arosa, Davos, Montana and many other Swiss resorts of the consumptive are well above this height.

In general, the advice offered in this little brochure is sound and it can be recommended to the attention and study of the tuberculous patient.

[1] "The Treatment of Pulmonary Tuberculosis," by Dr. Marc Jacquerod. Second English Edition, revised by S. F. Silverbauer, M.D., F.R.C.P. (Edinburgh); 1927. London: Baillière, Tindall and Cox. Foolscap 8vo., pp. 77. Price: 1s. 6d. net.

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## Electro-Therapeutics.

The Representative Body of the British Medical Association at its meeting held in July at Cardiff discussed and adopted a report of the Science Committee of the Association on the risks involved in the use of ultra-violet light apparatus by untrained persons. This report had been endorsed by the Council and submitted to the Representative Body. The findings of the Science Committee have been published in the annual report of the Council in the supplement to *The British Medical Journal* of April 28, 1928. Reference is made to the growing practice on the part of persons who have had no medical education and no adequate practical training of employing electro-therapeutic and radiation methods in the treatment of disease. Special emphasis is laid on the increasing sale of ultra-violet light apparatus for amateur and domestic use. The dangers of the unskilled and uncontrolled use of electricity, radium, X rays, diathermy and ultra-violet light as therapeutic measures are discussed in a very moderate manner. In our issue of August 4 Dr. J. Bell Ferguson dealt with the risks attaching to the improper employment of ultra-violet radiation. The Representative Body has determined that suitable courses of training in electro-therapeutics should be organized under medical direction for persons who wish to administer this form of treatment, that persons who have undergone a course in a satisfactory manner should be entitled to have their names entered on an approved roll, that one of the conditions attached to admission to and maintenance on the approved roll should be abstention from the treatment of any patient except on the responsibility and under the general supervision of a registered medical practitioner and that patients who require electrical or radiation treatment, should be referred only to those persons whose names are on the approved roll.

It is somewhat difficult to reconcile this decision with the dictum of the General Medical Council in regard to the employment of unqualified persons by registered medical practitioners. The offence of covering an unregistered practitioner is regarded by the General Medical Council as a serious offence and those found guilty of it, are liable to have their names removed from the medical register. The Representative Body had to consider the safety of the public and was faced with the fact that as there is no law in the United Kingdom prohibiting any charlatan or hairdresser from employing X rays, radium or any other form of radiation, this form of uncontrolled treatment has become exceedingly common. It is unlikely that Parliament would amend the law to render this form of practice a penal offence, just as parliaments are disinclined to forbid sight testing by spectacle makers. The proposal of the Representative Body, if carried into effect, would lead the public to regard the non-medical electro-therapeutist whose name is on the approved roll, as a person competent to treat disease.

This matter is as important in Australia as it is in the United Kingdom. There are many untrained persons who employ ultra-violet radiation as a bait. Sometimes the apparatus is a mere farce; some violet light is emitted and the public is duly impressed. The employment of this kind of treatment is not in itself dangerous and the main objection to it is that as the violet rays have practically no therapeutic action, the whole thing is a common swindle. It must, of course, always be remembered that in the event of a serious affection being present, valuable time is lost. It may be too late to apply an effective remedy, if the charlatan continues his futile treatment for long. At times, however, real apparatus is used. A person without medical education, without having been trained to understand the structure and functions of the body and its component organs and tissues in health and in disease and without having had experience of disease based on a study of its ætiology, pathology and manifestations, should not be permitted to treat disease under

any circumstances. There is no need to create a special class of unqualified persons to apply electrical or radiation treatment. The whole world knows that X rays have claimed very many victims from among the medical pioneers who worked bravely despite the danger and determined the conditions under which these powerful rays could be employed with benefit in the treatment of pathological affections. The risks attaching to the use of radium are of the same nature. Heat in the form of infra-red rays or in any other form may cause irreparable injury and death. In a similar manner the unskilled application of ultra-violet radiation is associated with sufficient risks to justify the claim that only those who are registered as medical practitioners, should be permitted to use it. We can recognize no reason for the training of non-medical persons to employ any of these forms of treatment. The medical profession would be well advised if it adopted an unyielding attitude in regard to this matter. Instead of assisting a layman to undertake this work, the medical profession should guard its rights zealously. No lay person should be encouraged to handle any electrical therapeutic apparatus. If a patient is unwise and consults an unqualified practitioner and an injury results from the unskilled application of any form of radiation, the unqualified practitioner should be prosecuted and the severest penalties should be demanded on all counts. A medical practitioner is liable if he treats a patient negligently or without reasonable exercise of caution or if he manifests ignorance or incompetence. An unqualified person should be equally liable for the results of ignorance, incompetence, carelessness or temerity and in addition he should be punished for having fraudulently indicated that he is competent to recognize and treat disease.

## Current Comment.

### ACROMEGALY AND DIABETES.

THE statement of Saint Paul to the effect that when one member of the body suffers, all the other members suffer with it, may well be applied to the constituent parts of the endocrine system. What little is known of these constituents shows that their interdependence is deep-seated and fresh indications are continually arising not only that there is a close relationship between the several parts of the system, but that attempts may be made by one member of the group to replace the secretion of another when the production of the latter has been interfered with by disease. A great deal of work has been carried out in regard to the relationship of pituitary extract to insulin production and many cases have been placed on record in which acromegaly has been accompanied by a condition bearing clinical resemblance to *diabetes mellitus*. It has been found that persons suffering from hypopituitarism display a high carbohydrate tolerance and conversely it has been shown that in hyperpituitarism there is a loss of carbohydrate tolerance. This has been ascribed to an inhibitory action on the part of the pituitary secretion on the normal insulin function. Two interesting communications have recently been made on this subject, one by Helmuth Ulrich and the other by W. M. Yater.[1] Ulrich's patient was a man, aged twenty-four years, who suffered from a tumour of the pituitary body and from acromegaly. Glycosuria made its appearance. In response to a moderate dose of "Insulin" the blood sugar became less, but when the dose of "Insulin" was increased, the blood sugar increased considerably in amount. Adequate reduction of blood sugar occurred after eighty and then one hundred and twenty units of "Insulin" were administered three times a day. After surgical operation on account of the tumour hyperglycæmia again occurred. This was regarded as being due in part to the injury of neighbouring cerebral tissue. After a partial reduction in amount the hyperglycæmia again occurred and, although "Insulin" lowered the amount of sugar in the urine, the blood sugar level remained unaffected. The findings are set out in charts and Ulrich points out that the charts indicate that "Insulin" had but little effect on the blood sugar level. In the first chart it is seen that the blood sugar was actually increasing while the dosage of "Insulin" was being increased and in the second half of the same chart that the hyperglycæmia persistently declined in spite of a moderately rapid decrease in the dosage of "Insulin." Further, when the patient at a later stage was on an unrestricted diet and when no "Insulin" was given, the blood sugar remained at a normal level. Ulrich refers to cases reported by other authors in which the glycosuria accompanying hyperpituitary disease has disappeared spontaneously. In his opinion there may be gradations of antagonism in different patients with hyperpituitary disease, ranging in intensity from none at all to almost complete inhibition. On the other hand, if it is true that pituitary tumours may give rise to glycosuria by pressure on neighbouring brain centres, the simultaneous presence of this pressure type (possibly amenable to "Insulin") with a hypersecretory type would lead to varying degrees of responsiveness to treatment with "Insulin." Again, it is in Ulrich's opinion conceivable that

[1] *Archives of Internal Medicine*, June, 1928.

some of the patients may develope true pancreatic diabetes owing to exhaustion of the pancreas from constant stimulation by the pituitary hyperglycæmia; such patients might then become more susceptible to treatment with "Insulin."

The manifestations in the six patients described by Yater were not similar to those in Ulrich's patient in that the response to "Insulin" in three of them was "just as striking as in any case of diabetes." The diabetes of the other three responded to dietetic measures. In Yater's patients the polydipsia and polyuria were present in the more severe forms and were proportionate to the intensity of the disease. It may be pointed out in passing that Yater believes that the incidence of the association of diabetes and acromegaly may be greatly underestimated. His reasons for this statement are that one patient had a high renal threshold for glucose and that the glycosuria would not have been discovered if she had not been examined at a time when when she was eating sparingly of carbohydrates. In another instance the urine was sugar free for three years before the clinical appearance of diabetes, but the fasting blood sugar was two hundred milligrammes per hundred cubic centimetres and a diabetic glucose tolerance curve was obtained at that time. The patients in Yater's series were six of a group of eight who were discovered at the Mayo Clinic among seventy-nine patients suffering from acromegaly. It is important to note that three of the six patients had an increased basal metabolic rate and in all three of them the increase was presumed to be due to hyperthyreoidism. The basal metabolic rate in Ulrich's patient was −11. The conclusion reached by Yater is that it seems plausible to assume that the diabetes occurring with acromegaly is due to the same factor producing ordinary diabetes, namely, an insufficient production of insulin. At the same time he regards it as possible that enough insulin might be secreted, but that it might be neutralized by some new substance. The points advanced by Yater in support of his assumption are the following: (i) Acromegaly is frequently associated with *diabetes mellitus;* (ii) the syndrome of hypopituitarism is infrequently associated with *diabetes mellitus;* (iii) even though hypophysectomy in man has never been followed by a cure of the diabetic condition, it has been followed by a state of increased sugar tolerance, this increase in tolerance has been demonstrated even when clinical diabetes did not exist; (iv) even though clinical diabetes may not be present, glucose tolerance may be diminished in acromegaly; (v) transient hyperglycæmia and glycosuria may be produced by the injection of pituitary extracts; (vi) pituitary extract is capable of preventing or relieving hypoglycæmia and convulsions produced by injection of "Insulin."

The first point for consideration is the difference of response to "Insulin" in Ulrich's patient and in those of Yater. Acromegaly is regarded as being brought about by a condition of hyperpituitarism due to an hypophyseal adenoma of a chromophilic type. It has been shown recently by Cameron that in the guinea pig excision of part of the pancreas is probably followed by regeneration of acinar and islet tissue; that regeneration is inhibited by giving "Insulin" and pituitrin; that both "Insulin" and pituitrin cause hypertrophy of the normal pancreas and that pituitrin produces an increase in the relative amount of islets. If this latter finding in normal guinea pigs were to be applied to human beings, it would be expected that hyperpituitarism would result in more islet tissue and thus in more insulin and in increased carbohydrate tolerance. There is no justification for such application, however. There is nothing to show that the pancreas in a person with hyperpituitarism is normal. There is on the contrary every justification for the assumption that the hormonal control of the pancreas would be upset and hyperglycæmia and glycosuria might result. In this way it would be possible to explain the fact that carbohydrate tolerance is impaired in some cases of acromegaly and not in others and also to explain the varying degrees of carbohydrate intolerance. At the same time it is not suggested that lack of hormonal control is the only means by which hyperglycæmia might arise. It is much more difficult to explain the failure of "Insulin" to influence the hyperglycæmia in Ulrich's patient, the antagonism reported by other observers between pituitary extract and "Insulin" and the spontaneous disappearance of hyperglycæmia in some instances. According to Yater this spontaneous disappearance is the only difference between diabetes occurring alone and diabetes occurring in association with acromegaly. There is a further difference, however, and that is in the *post mortem* appearances in the pancreas. In one of his cases degenerative changes of a slight nature were found in the islands of Langerhans, but these were only of a slight nature. He also refers to *post mortem* findings by other observers which consisted mainly of interlobar fibrosis, the islets apparently being normal. In *diabetes mellitus* the changes in the islands of Langerhans are generally very pronounced. The possibility of pressure by the pituitary tumour on adjacent brain centres must not be forgotten, for it has been shown experimentally and at operation that trauma in this neighbourhood will induce glycosuria. But it would not be expected that pressure would result in a glycosuria characterized by exacerbations. If pressure on an area of the brain will induce glycosuria, it is likely that a chemical stimulus from a neighbouring tumour would have a similar effect and this effect might well be of an intermittent nature. Such a stimulus acting through a brain centre might act directly on the pancreas and again the sympathetic nervous system might play a part. The weight of evidence at present suggests that the diabetes associated with acromegaly is not always similar to what is known as *diabetes mellitus.* It is, of course, always possible, though not probable that acromegaly and *diabetes mellitus* may have a simultaneous origin in the same person.

# Abstracts from Current Medical Literature.

## PÆDIATRICS.

### Scarlet Fever.

R. A. STRONG (*Archives of Pediatrics*, March, 1928) gives a *résumé* of much of the research work which has been done on the ætiology of scarlet fever up to the point which has been reached recently, where it seems to be proved that scarlet fever is caused by one or perhaps two strains of the *Streptococcus hæmolyticus*. In 1923 Gladys and George Dick used human volunteers in their experiments and succeeded in producing scarlet fever by inoculating them with a hæmolytic streptococcus isolated from a scarlet fever patient. The author describes the production of toxin for skin tests and gives the technique for the test as follows: A 0·5 cubic centimetre "Record" syringe graduated in 0·1 of a cubic centimetre with a 1·25 centimetre (half inch), 26 gauge needle, is used. The flexor surface of the forearm is cleaned with alcohol and dried. In view of the fact that toxins are standardized so that 0·1 cubic centimetre represents a skin test dose, exactly this amount should be injected intradermally. Long boiling (twenty minutes) is necessary to destroy all traces of toxin left in the syringe and needle. Antiseptics should not be used. G. and G. H. Dick regard an area of reddening, one centimetre or more in diameter, as indicating a reaction. The result of the test has been invariably positive in those who subsequently developed scarlet fever, while those who do not react, generally escape. The test is of value in diagnosis, for example, a strong reaction in a doubtful case. A positive result in convalescence is an indication that the disease was not scarlet fever. A failure to react does not usually occur until the rash has faded. Infants under six months generally yield no reaction, children from six months to six years manifest great susceptibility, children at school in the less congested areas of a city or in the country yield 100% to 200% more positive results than those in more congested parts. Active immunization is carried out as follows: Five injections are given subcutaneously at intervals of five to seven days. The first injection consists of five hundred skin test doses of toxin, the second 2,000, the third 8,000, the fourth 25,000, the fifth 60,000 to 65,000. Children under two years receive half these doses. No one should be considered immune until he fails completely to react to the test. Scarlet fever toxin should never be given to persons who have already been infected as a result of recent exposure, nor should it ever be used in the treatment of scarlet fever patients. They usually have all the toxin that they can deal with and frequently more. Recently it has been discovered that toxin can be detoxified and still retain its antigenic properties by treatment with sodium ricinoleate. Experiments have been carried out in which 3,000 to 4,000 skin test doses of toxin, detoxified with sodium ricinoleate, were given to 1,542 patients yielding reactions to the Dick test and 77·3% to 90% of the patients were immunized within eight days of the injection. Of these 70% still yielded no reaction at the end of six months. The author divides treatment into prophylactic, serum and medicinal and holds that the first two are the most important. In regard to prophylaxis, active immunization is the ideal method and the author advises it as a routine in children from six months to six years old and in all others who give a positive result to the Dick test. If a susceptible child is exposed to infection and the throat swabs yield a culture of the organism, a prophylactic dose of antitoxin may be given or the patient may be closely watched and a therapeutic dose given if symptoms develope. If a prophylactic dose is given, another culture should be made in two or three weeks and if this is sterile, active immunization should be undertaken. If the throat and nose cultures do not yield the causative organism, active immunization is indicated, provided that further exposure to infection can be avoided during the course of immunization. In regard to serum treatment, the author states that its value is beyond question and that it offers the most rational method of treatment available. He recommends the serum made by the Dick method and prepared in prophylactic and therapeutic packages. It should be given by intramuscular or in the treatment of those who are acutely ill, by intravenous injection.

### Vomiting with Acetonuria.

O. C. M. DAVIS (*Archives of Disease in Childhood*, February, 1928) makes a study of two types of vomiting in children accompanied by acetonuria. He defines ketosis as a condition in which acetone bodies are present in the urine, and acidosis as a condition in which there is an abnormal tendency for acid products of metabolism to accumulate in the blood and tissues. Acidosis is frequently preceded by ketosis and may be checked by the timely administration of bases. Cyclic vomiting, the author believes, is a definite clinical entity associated with a nervous diathesis. He draws a distinct line between this and what he describes as "severe acetonuric vomiting due to digestive disturbances." In the latter there is no neurotic element and the attacks are limited to one or two. The author suggests a method of urine analysis by which the two groups can be differentiated and the course of the disease followed. The ratio RA which denotes the relationship between the free and ammonia-combined acid in the urine, is obtained as follows: Twenty-five cubic centimetres of urine are titrated with decinormal sodium hydroxide solution, phenolphthalein being used as an indicator; this gives the free acid value. Then to the same solution neutral formaldehyde solution is added to liberate ammonia-combined acid which is then titrated with the same alkaline solution. RA is obtained by dividing the second titration by the first. A test is made for acetone by the nitroprusside method. In both groups there is an increase of RA and of acetone bodies during attacks; but in cyclic vomiting it seems to rise in successive attacks and does not fall to normal so readily. A study of a patient with cyclic vomiting showed that the ratio, RA, in normal health lay between 0·87 and 1·23. During an attack it rose to 4·47. Analysis of urine in the second group showed that the normal ratio, RA, lay between 0·87 and 1·23; during attacks RA rose to high figures and acetone bodies appeared, but recovery to normal was rapid and recurrences were infrequent. Dietetic errors were frequently the precursors of the second type of attack. The treatment consists of early administration of aperients and alkalis (calomel and sodium bicarbonate).

### Cardiac Failure.

P. E. ROTHMAN AND B. W. LEONARD (*American Journal of Diseases of Children*, January, 1928) report some unusual cases of acute cardiac failure in children under five years of age. They state that heart failure, other than that due to diphtheria or congenital heart disease, is rare in childhood. First attacks of rheumatic carditis rarely lead to failure, but when they do, a fatal result is frequent; this condition is more likely to be found in young children. The authors quote several cases in which at autopsy the cause of the acute failure was proved to be a fresh rheumatic infection. In one of their own cases there was similar proof, though in none of these were there any symptoms or signs of rheumatism. *Ante mortem*, in the absence of extracardiac manifestations it is difficult to make a diagnosis. Sometimes a mild diphtheria may be overlooked and be followed by myocardial failure. A Schick test may help in establishing a diagnosis. Congenital heart disease is generally easy to recognize and heart failure with infectious diseases presents a different clinical picture to that under discussion. Malformations of the chest with the usual associated pulmonary conditions may lead to myocardial changes resulting in acute heart failure and occasionally the so-called idiopathic hypertrophy of the heart may be the causative condition. White has shown that endocarditis under the age of two is most frequently the result of sepsis. The reported patients gave no history and showed no evidence of rheumatism, diphtheria or any unusual infection. Although definite proof (*post mortem*) of rheumatism was obtained in only one instance, the similarity of the clinical pictures makes it highly probable that a rheumatic infection was the causative factor in most of the patients

studied. Abt and others have drawn attention to some unusual features in cardiac failure in young children. The acceleration of the respiratory rate and the rapid engorgement of the liver are pronounced and may be the only signs present on which a diagnosis must be made, although the classical signs of decompensation may appear subsequently. Examination of the heart often reveals little and auscultatory phenomena are frequently absent. With regard to treatment, Jacobsen and Davison claim to have demonstrated that digitalis is a distinct aid in heart failure of rheumatic origin in children. In proportion to body weight most of their patients required two and a half times the adult dose. The authors' patients required similar dosage to produce adequate effect.

## ORTHOPÆDIC SURGERY.

### The Use of Grafts in Non-Union of Fractures.

FREDERIC J. COTTON (*Journal of Bone and Joint Surgery*, January, 1928) describes his technique in the use of bone grafts for the treatment of non-union in fractures. All fibrous tissue is removed from the ends of the fragments, so that properly nourished bone is exposed. The fresh graft is then taken from the tibia or rib and a narrow strip of bone with periosteum attached is retained for subsequent use. The bone on the deep surface of the graft is cut into small fragments no more than eight millimetres in the longest diameter and these are packed into the gap between the ends of the bone. The thin strap of bone with periosteum attached is then placed on the outside in order to hold the bone chips in close contact, under some pressure. Rigid fixation of the limb is necessary and diathermy is started early.

### Stabilization of the Shoulder Joint for Habitual Dislocation.

HANS SPITZY (*Surgery, Gynecology and Obstetrics*, February, 1928) describes a method of stabilizing the shoulder joint for habitual dislocation. He says that all of the well known methods of rehabilitating the joint have some weak point. Some that prevent redislocation, hamper the working capacity of the joint and others which do not impair its functional activity, are not reliable in preventing redislocation. In this method the deltoid muscle is separated from its insertion through a curved incision and the main flap retracted upwards, care being taken to avoid injury to the axillary nerve. The capsule of the joint is exposed and a silk ligature, double four-ply strong with a total tensile strength of one hundred and sixty kilograms, is tied around the surgical neck of the humerus with a knot on the anterior aspect. The long ends of the silk are then made to transfix the coracoid process close to the origin of the biceps muscle and tied tightly. The capsule on each side of this band is lifted and the folds are sutured around the silk band forming a sheath similar to that through which the tendon of the long head of the biceps passes. The flap is replaced and the patient begins careful exercises after four weeks' rest. Dislocation has not recurred and the patients operated on by this method have recovered complete working capacity and free movements.

### Stabilization of the Flail Leg.

H. TYRRELL GRAY (*The British Journal of Surgery*, January, 1928) advocates arthrodesis of the knee joint in the treatment of patients with flail leg resulting from infantile paralysis, provided that no further degree of recovery can be hoped for. He states that it is possible in all cases to achieve bony union with certainty. As a rule growth is not interfered with, but he reports one case in which 30% *genu valgum* resulted.

### Reconstructive Surgery of the Hip.

ERNEST W. HEY GROVES (*The British Journal of Surgery*, January, 1928) describes various methods of reconstructing the hip joint with particular reference to non-union in fractures and expresses the opinion that a bone peg preferably driven through the trochanter into the head of the bone is the most suitable method. He also describes Whitman's, Albee's and Baer's operations for various conditions in the hip and Jones's operation for arthroplasty. His opinion is that the conservative method of treating congenital dislocation of the hip should be used and is usually successful up to the age of about four years, but after that the fibrous tissue tube between the head of the femur and the acetabulum is usually contracted to such a narrow diameter that it is necessary to incise it in order to replace the head. He also describes his method of reconstructing the acetabulum from portions of the head of the femur and also of constructing a new upper rim by means of a shelf of bone chiselled from the ilium. In residual paresis from infantile paralysis when the abductors of the hip are weak, he constructs an abductor muscle by uniting the *tensor fasciæ femoris* to the *erector spinæ* through a tunnel under the attachment of the *vastus externus* below the great trochanter.

### Kümmell's Disease.

J. CARDIS, G. F. WALKER AND R. H. OLIVER (*The British Journal of Surgery*, April, 1928) discuss post-traumatic spondylitis or Kümmell's disease. They report the history of a number of patients. The injury varied in type from direct injury to the back to a mere jarring by jumping from a moving vehicle. The severity of the lesion varies from a fracture with or without dislocation to no demonstrable lesion at all. When there is a fracture, it is always in the anterior portion of the vertebra. There is an interval following the injury during which the patient may be confined to bed, or he may feel no ill effects whatever. There is usually some pain at the site of the vertebra which will ultimately be destroyed. The latent period between the cessation of the original symptoms and the onset of severe and progressive disability is noteworthy. It may last for days, weeks, months or years and the future cripple may even resume heavy work. First returning symptoms to be noticed are local, namely, pain, tenderness and weakness at the site of the lesion; but remote symptoms including all grades of limb and girdle pain and all grades of paraplegia, tend to supervene. The process goes on till the cord is transversely crushed unless the crumpling collapse of the vertebral body is arrested by orthopædic methods and in these circumstances the prognosis is singularly good. Various hypotheses have been advanced to account for the symptoms. They include: (i) Focal hæmorrhages and thrombosis of the small vessels, causing lack of nutrition; (ii) trophic disturbances set up by injury to the nerves and the local part of the cord; but the general opinion as to the essential pathological change is summed up by Fosdick Jones with the statement that minute multiple traumata to the osseous and ligamentous structures of the spine cause cracks and small hæmorrhages. The authors were able to study a case *post mortem* and had sections cut of the collapsed vertebra. They found multiple small hæmorrhages in the *spongiosa*, atrophy of the bony framework and a decrease in number of the marrow cells which were poorly stained. The points which they emphasize in the diagnosis are: (i) The sufferer is generally in all other respects a healthy, robust workman; (ii) there is no abscess formation; (iii) radiology reveals a wedge-shaped vertebra with possibly a fracture, but with clear edges and intact discs. In regard to treatment, rest, extension of the spine, support by some form of jacket or spinal bone graft are advised. "If a man is back at work even two years from the original injury he is very fortunate and so are his advisers."

### A Portable Convex Frame.

PAUL C. COLONNA (*Journal of Bone and Joint Surgery*, January, 1928) illustrates an easily portable Bradford frame. The lateral arms of the frame are cut across close to the middle and sleeves are then used to unite them. Any degree of convexity can be rapidly obtained by altering the angle of the sleeve-piece used.

### Fractures of the Semilunar Cartilages of the Knee Joint.

M. S. HENDERSON (*The Journal of the American Medical Association*, January 21, 1928) has reviewed two hundred and thirty-two cases in which a semilunar cartilage was removed from the knee joint. Of these seventy were of the bucket-handle type of fracture, two being in the external cartilage and sixty-eight in the internal.

# British Medical Association News.

## SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Melbourne Hospital on May 16, 1928. The meeting took the form of a series of demonstrations by members of the Melbourne Hospital Clinical Society. The first part of the report of the meeting was published in the issue of August 4, 1928, at page 154.

### Recurrent Biliary Colic.

MR. W. A. HAILES showed a woman, aged seventy years, a widow, who for many years had suffered from persistent flatulent dyspepsia, epigastric fullness and discomfort arising about half an hour after meals. Her indigestion had been relieved by alkaline eructations and occasional vomiting. Attacks of severe colic in the right upper part of the abdomen were frequent.

In July, 1927, through Kocker's gall bladder incision an acutely inflamed partly gangrenous gall bladder containing one stone and muco-pus had been removed. The gall bladder had been dissected from fundus to neck, which was adherent to the inflamed wall of the duodenum. Convalescence had been uneventful except for retching attacks.

The present illness had commenced five months previously (in December) when she had experienced itchiness of skin and had noticed that her urine was dark. This had been followed by attacks of retching and later by gripping pain in the right upper part of the abdomen. Fæces had been quite white. Pain had increased in frequency and severity, the attacks lasting for an hour. The flatulent indigestion had recommenced and she had been jaundiced in January. Since then the jaundice had varied in degree and her urine had been less dark in colour when pain was absent. Shivers had commenced with the colic six weeks before admission followed by cold sweats with chattering of her teeth. A typical attack began with shivering and vomiting and then severe stabbing pain under the right costal margin not radiating through to the back, sweats then followed in an hour's time, while pain and vomiting had persisted for about six hours.

Her appetite had been poor. Her bowel actions had been irregular and she had been constipated for three or four days at a time. Micturition was very frequent both day and night. There had been no scalding. Sleep had been poor. She had lost a lot of weight since cholecystectomy was performed.

Examination had revealed an elderly, thin-faced woman with her skin deeply jaundiced and a temperature of 37·3° C. (99·2° F.), a pulse rate of 72 per minute and a respiratory rate of 28 per minute. Her pupils had reacted to light and accommodation and the conjunctivæ had been deeply jaundiced. Her tongue had been moist and clean and her breath had smelt sour. The systolic blood pressure had been 138 and the diastolic pressure 80 millimetres of mercury. The specific gravity of the urine had been 1,005, its reaction acid, it had contained no albumin or sugar and had been clear on microscopical examination. The cardiac apex beat had been in the fifth intercostal space ten centimetres (four inches) from the middle line. There had been one finger's breadth of right cardiac dulness. The sounds had been clear, but faint at all areas. On examination of the lungs the only abnormality discovered had been a prolongation of the expiratory sound over the whole chest. On examination of the abdomen a scar from Kocher's gall bladder incision had been found. Great tenderness had been present in the right hypochondrium. No tumour or organ had been palpable. No abnormal neurological signs had been found. The skin had been deeply pigmented with bile pigments and numerous scratch marks had been found all over the body.

The Fouchet test had yielded a reaction and on application of the Van den Bergh test an immediate positive result had been obtained indicating the presence of eight units of bilirubin. Estimation of the blood urea had yielded a figure of twenty-four milligrammes per hundred cubic centimetres.

On the fourth, third and second days before operation ten cubic centimetres of a 5% solution of calcium chloride had been injected intravenously and 1·3 gramme (twenty grains) of calcium lactate had been given by mouth three times a day. The pain had been controlled by morphine.

As a result of discussion it was concluded that although the gall bladder had been removed, in such cases isolation of the common duct which was usually enlarged, should not be very difficult if the duodenum was first isolated.

A second operation had been performed on May 7, 1928. Under ethylene anæsthesia, Mr. Hailes had made an upper right paramedian incision, had retracted the rectus muscle which was rather atrophic, in a lateral direction and had opened the peritoneal cavity. Many adhesions had been present between the greater omentum and the anterior abdominal wall and liver. These had been separated until the upper border of the first part of the duodenum was identified. Mr. Hailes had then dissected out a bile-containing canal and had followed it distally, but it had been lost in fibrous tissue on the duodenum and no distal portion could be found. However, a little deeper another bile-containing tube had been isolated and, when it was opened, a director had been passed up into the hepatic ducts and down towards the pancreas, where it was obstructed by a calculus impacted in ampulla of Vater. The stone had been removed by lithotomy forceps and passage was then free. A small drain tube had then been inserted and sewn with plain catgut into the proximal part of the common bile duct and made as bile-tight as possible. The remains of the dilated portion of the cystic duct had been ligated and removed.

The pouch of Morrison had then been drained and the abdominal wound sewn up with great difficulty, because of the friability of the peritoneum. The anterior rectus sheath had been closed with interrupted chromicized sutures and the skin wound with rubber on silkworm gut and horsehair.

After operation, on May 8, 1928, bile had drained freely from both tubes and the general condition of the patient had somewhat improved. On May 9 the urine had been free from sugar, diacetic acid and acetone. On May 10 drainage of bile had been profuse, the jaundice was subsiding and the drain had been removed from Morrison's pouch. Improvement had been continued and on May 16, 1928, a moderate drainage of bile into the dressing had occurred and about two hundred and forty cubic centimetres from the common bile duct.

### Injury to the Kidney.

Mr. Hailes also showed a male patient, aged forty-one years, who had been admitted to hospital on March 23, 1928, with a history of having fallen from a height of about 1·25 metres on to his left side on the previous day. He had passed blood in his urine ever since. His abdomen had begun to become distended on the day of admission. His bowels had not been opened, though their action had previously been regular. He had vomited a few times, but had had neither cough nor hæmoptysis. Prior to the accident he had been a healthy man.

The patient's temperature on admission had been 37·5° C. (98·6° F.), his pulse rate 112 and his respiratory rate 26 in the minute. His systolic blood pressure had been 105 millimetres of mercury. Hourly records of his blood pressure had been kept and it had remained unaltered. The pulse rate had diminished, but its volume had improved. Blood had been found in his urine on microscopical examination. The abdomen had been distended and its movements on respiration had been restricted. There had been no absolute rigidity, but resistance had been present on the whole of the left side. There had been some fullness in the left loin with ecchymosis into the skin. The patient had complained of tenderness in this spot and in the left iliac fossa. No tumour or organ had been palpable and both flanks had been resonant. The heart and nervous system had been clear. On examination of the chest the only abnormality had been some tenderness over the lower ribs on the left side. The patient's bowels had been opened by high turpentine enemata and the bowels had subsequently acted naturally. Hæmaturia had persisted. The abdominal distension had gradually become less. A diagnosis of hæmothorax had

been made on March 28, 1928, on account of the dulness at the left base with diminished breath sounds and diminished vocal resonance. The chest had subsequently been explored with a needle in the eighth and tenth intercostal spaces, but no blood had been withdrawn. On April 20, 1928, X ray examination had revealed kidney shadows, largely obscured by gas on the left side, but the right side had been apparently normal. At the same time fracture of the eighth and twelfth ribs on the left side without obvious displacement had been discovered. On April 26, 1928, cystoscopy had revealed blood-stained urine coming from the left ureteric orifice. A pyelogram had been taken and Dr. Clendinnen had reported that on the left side there was some irregularity and incomplete filling of the lowest calyx with opaque media disseminating from this area throughout the tissue lateral to the whole of the lumbar region of the spine. He had thought that in all probability a large hæmatoma was present. The right pyelogram had been normal except for some irregularity at the lateral borders of the calyces, probably the result of trauma. On May 14, 1928, the patient's temperature had been 39·5° C. (103° F.), but he had made no complaint. At the time of the meeting the patient's temperature was normal.

In the discussion on this case the points of interest to which attention was drawn, included the question of paralytic ileus from the retroperitoneal effusion of blood and the long continued hæmaturia following the injury. Attention was also drawn to the pyelogram showing the sodium iodide in the retroperitoneal hæmatoma together with disorganization of the lower calyx of the left kidney. It was agreed that in view of the persistence of the hæmaturia nephrectomy was indicated.

### Bladder Tumour.

The third patient shown by Mr. Hailes was a man, aged fifty years, who gave a history of intermittent hæmaturia, painless and often profuse, for eight years with occasional frequency and urgency. In 1925 and 1926 he had been treated by transurethral electro-coagulation for a tumour of the bladder with several buds. The patient had been admitted to hospital for the second time on May 9, 1928, with a recurrence of painless intermittent hæmaturia. He had complained of some difficulty in commencing urination which was worse than it had been before, and of slowness in discharge with a small stream, but no straining. He had not complained of frequency of micturition, of scalding or of pain. Otherwise he had been healthy. Apart from the urinary condition physical examination had revealed no other abnormality.

On May 10, 1928, under general anæsthesia an operating cystoscope had been passed into the bladder. A small secondary implant had been found on the posterior wall of the bladder as well as a dangling tip of another growth, the base of which could not be seen because of its position, just anterior and to the right of the urethral orifice. The small implant had been treated by diathermy through the cystoscope and the bladder had been opened suprapubically. A moderately large vascular papillomatous growth had been found just to the right and anterior to the internal urinary meatus. This had also been treated by diathermy and the bladder closed with continuous catgut sutures; for the rectus sheath interrupted sutures of chromicized catgut had been used. An indwelling rubber catheter had drained the bladder *per urethram*.

Mr. Hailes said that the points of interest in this case were: (i) The secondary implantation growth in the portion of the bladder between the internal urinary meatus and the summit was almost inaccessible without Joly's new cystoscope which had not been at hand; (ii) in regard to the pathological nature of the tumours and their life history the question arose as to which tumours became malignant; (iii) the trivial amount of damage inflicted on the bladder at previous operations by extensive electro-coagulation as seen through the suprapubic incision.

### Hydronephrosis.

Mr. Hailes also showed a series of pyelograms to demonstrate all stages of hydronephrosis, both obstructive and so-called infective. In several of the patients from whom the latter were taken, the urine had been sterile on culture. Mr. Hailes invited comment on the causation of the so-called infective variety and on its treatment.

### Recto-Urethral Fistula.

MR. HAROLD DEW showed a patient who had suffered from recto-urethral fistula. The patient had had retention of urine with a Neisserian infection for which he had been treated elsewhere. On admission he had had urethritis, with the passage of gas and fæces *per urethram*. He had had cystitis and pyelonephritis with attendant severe toxæmia. In addition an ulcerative proctitis had been present. At first it had seemed as if he would die of the combined effects of these infections, but following suprapubic drainage of the bladder with irrigation he had improved. A temporary colostomy had then been performed so that both urine and fæces were diverted. Examination had revealed a direct communication between the rectum and the bulbous portion of the urethra, distal to a stricture of the latter. The patient had an infantile urethra, but the stricture had admitted a Number 7 English sound. About fourteen days after admission he had developed a large perineal abscess which was opened and drained. His general condition had improved and he had been discharged wearing both a colostomy and suprapubic belt, after two months in hospital. He had returned after a month and the fistulous communication had appeared smaller and the rectal mucosa was healthy. In the hope that the fistula might close naturally he had been treated with urinary antiseptics for two more months, but at the end of that time methylene blue injections had still revealed a communication. Six months after his admission a perineal repair of both openings with removal of the fistulous track had been undertaken and a month later the colostomy had been closed after having functioned well for seven months without causing the patient much trouble. The suprapubic opening had been allowed to close spontaneously.

Examination revealed no trace of communication and the patient's general health was good, although he still had some residual vesiculitis and prostatitis which was under treatment. This patient illustrated some of the complications met with in such cases, the benefit of diverting urine and fæces in converting an acute into a chronic condition, the futility of expecting spontaneous closure and the need for direct attack on the fistula.

### Extrapleural Thoracoplasty.

Mr. Dew's second patient had been treated by extrapleural thoracoplasty to cause collapse of the chest wall and obliteration of a large intrathoracic cavity.

The patient had had a large left apical pulmonary hydatid cyst evacuated and drained. It had suppurated and owing to the presence of a large bronchial opening a broncho-pleural fistula had resulted. Owing to non-collapse of the cyst discharge had persisted for five and a half months in spite of irrigation and free dependent drainage. This was due to the large size, the thickness of the adventitia and the position inside the rigid upper part of the thoracic cavity. Finally an intrapleural posterior thoracoplasty with removal of portion of the upper nine ribs had been performed. This had produced considerable collapse of the chest wall, obliteration of the cavity and complete cessation of drainage in under four weeks. Since this the patient had been very well and was doing active work. Skiagrams were shown to illustrate the primary condition, the non-collapse of the cyst and the final condition at the present time while the patient illustrated the excellent functional result. Mr. Dew stated that he had now a small series of similar cases and that he regarded the method of thoracoplasty as the ideal one for this and similar intrathoracic cavities.

### The Use of Fascia Lata in Hernia Repair.

Mr. Dew's third patient illustrated the use of *fascia lata* in the repair of a large hernia. The patient had been sent by the gynæcologist who reported that she had had a hernia of the gravid uterus which had prolapsed through the abdominal wall in front of her thighs necessitating recumbency during the latter part of her pregnancy. On examination the patient had had a huge ventral hernia between the recti muscles, so that practically all the intestines entered the sac when the patient stood up. The recti had been twenty centimetres (eight inches) apart and on palpation in the recumbent position the vertebral bodies and pancreas *et cetera* had been readily examined. Opera-

tion had been performed, the excess of skin had been removed and the two recti had been brought together with a double layer of *fascia lata* sutures.

Mr. Dew pointed out that the patient had a sound abdominal wall and should be in no danger of a recurrence owing to the persistence of this tissue *in situ* and its tensile strength.

He strongly advocated this method of repair of large hernia.

### Epithelioma of the Lip.

MR. MERVYN STEWART showed a man, aged seven-eight years, who was suffering from early epithelioma of the lip of six months' duration. The patient illustrated the truth of Quervain's dictum that any hard sore spot on the lower lip, repeatedly forming crusts and bleeding when the crusts were removed, was already carcinomatous. Mr. Stewart proposed to have the patient treated with radium, but the consensus of opinion of those present was that surgical measures should be employed.

### Renal Calculus.

Mr. Stewart's next patient was one who suffered from renal calculus. The points of interest were: (i) The association with prolonged recumbency, the patient being a hopeless cripple as the result of infantile paralysis as a child; (ii) the value of the pyelogram as demonstrating the stone to be lying in the renal pelvis. Extreme scoliosis made accurate diagnosis impossible without the pyelogram and also complicated the operation for exposure of the kidney.

### Congenital Spastic Paraplegia.

The next patient was a girl, aged fourteen years, who suffered from congenital spastic paraplegia of great severity. Bilateral lumbar ramisection had been performed elsewhere with little benefit. The consensus of opinion of those present was that peripheral operations were the most satisfactory for this type of condition.

### Gall Bladder Disease.

Mr. Stewart also showed two patients on whom he had performed cholecystectomy. He had been able to confirm the very accurate X ray diagnosis by cholecystography as to the number and the location of the gall stones present.

### Intestinal Obstruction.

Mr. Stewart's last patient was one in whom at operation for intestinal obstruction a large gall stone had been found impacted in the lower end of the ileum. The point of interest was that the stone had ulcerated from the gall bladder into the duodenum and from there had ulcerated into the ileum. The fistulous communication into the ileum had been found at operation and dealt with by separation of the viscera and suture of the fistulous openings.

### Plaster Casing for Fractures.

MR. A. E. COATES and DR. L. WAIT showed a series of patients illustrating the use of the plaster casing and the plaster mould in fractures of the forearm and in fractures of both bones of the leg just above the ankle joint. A skeleton plaster splint was shown as being particularly useful in compound fractures of both bones of the leg near the ankle. This fracture was notoriously difficult to treat owing to the lack of control of the lower fragment and Mr. Coates considered that it was necessary to put such fractures up in some degree of *equinus* as then the strong fascial bands holding the tendons in front of the ankle were stretched and drew the fragments together. Two patients in whom there had been compound fractures of this kind following motor cycle accidents, had been so treated with perfect results.

### Rupture of Brachial Plexus.

Mr. Coates and Dr. Wait also showed a young man who had ruptured all three trunks of his brachial plexus by falling on his outstretched hand. The case was of interest on account of the severity of the lesion, complete paralysis of all muscles of the upper limb and anæsthesia being present.

### Renal Tumours.

MR. J. T. TAIT showed three patients who were suffering from renal tumours and demonstrated the pyelograms in connexion with each.

The first patient, a male, aged thirty-five years, had complained of severe colic in the left loin and along the course of the left ureter three months before. This had been accompanied by profuse hæmaturia. There had been milder attacks of pain since. The urine had always contained blood on microscopical examination and also many bacilli. No swelling was felt in the loins.

On cystoscopy a smoky efflux had been seen from the left ureteric orifice, from the right side the efflux had been clear. Both ureteral catheter specimens had contained pus cells and many coliform bacilli. Indigocarmine, given intravenously, had appeared from the right kidney in ten minutes, on the left side it had delayed to twenty minutes. A left pyelogram was shown with a filling defect in the upper calyx of the kidney. This had been confirmed on refilling the pelvis and taking a second pyelogram.

Left nephrectomy had yielded a kidney of normal size, adherent at the upper pole, with a prominent cystic swelling of the size of a large cherry on the dorsal surface of this area (the specimen was shown). On section of the kidney a soft papillary growth was seen in the region of the swelling and encroaching on the lumen of the upper calyx. Microscopical examination had proved it to be a carcinoma. The patient was well eighteen months after operation with no microscopical blood in the urine on repeated tests.

The second patient was a female, aged twenty-seven, who had noticed increasing duskiness of the skin, coldness of the hands and feet and slight dyspnœa on exertion over a period of six years. Her general health had been good and there had never been any hæmaturia. Blood examination had revealed 140% hæmoglobin and a red cell count of 9,500,000 per cubic millimetre. In August, 1926, a large tumour had been found in the region of the right kidney and the spleen had been palpable 2·5 centimetres (one inch) below the costal margin. X rays at that time had revealed both kidneys apparently much enlarged and a right pyelogram demonstrated some elongation of the renal pelvis with normal calyces.

There was a very large oval swelling occupying almost the right half of the abdomen, also an enlarged left kidney and spleen. Pyelograms of the right kidney revealed a persistent filling defect in the region of the lower calyx and the right ureter was displaced towards the midline in an evenly rounded curve. Differential function tests gave indigocarmine in five minutes from the left side and from the right kidney in ten minutes.

It was suggested that there was a large cyst projecting from the lower pole of the right kidney and the advisability of operative procedure was discussed.

Mr. Tait's third patient was a male, aged thirty-six years, who had been admitted to hospital in July, 1926, with hæmaturia which had followed a blow in the left loin. He had been in good health previously. On examination the right kidney had been found to be enlarged and in the left loin there was a large, firm, but movable mass. The urine had contained blood and some granular casts. A pyelogram of each kidney was demonstrated which revealed definite elongation and narrowing of each renal pelvis with stretching of the necks of the calyces. The ureters were displaced towards the mid-line.

At the meeting it was found that the condition had advanced but little in twenty-two months and the patient had continued in good health without further hæmaturia.

The diagnosis of polycystic disease of the kidneys had been made and Mr. Tait expressed the opinion that the pyelograms were characteristic of this disease.

### Stone in the Ureter.

Mr. Tait also showed two patients who had suffered from ureteral calculi and had been relieved by endoscopic operations.

One man, aged forty, had complained of several attacks of renal colic on the left side. There had been pus in the urine, but never any hæmaturia. The X ray film revealed a small irregular shadow near the left ischial spine and further films were exhibited to demonstrate the diagnosis

of stone within the ureter by the passage of an opaque catheter which was seen to be touching the shadow. A pyelogram and ureterogram were shown and there was found to be great dilatation of almost the whole of the ureter as well as some enlargement of the renal pelvis.

The intravesical portion of the ureter had been slit up with scissors through the cystoscope and the patient had passed a small irregular stone two days afterwards.

The other patient, also aged forty, had noticed hæmaturia at intervals for the previous five years. During the last four weeks he had had a constant dull pain in the left loin which radiated to the groin and the urine had been constantly cloudy. In the X ray films were seen a group of small shadows in the region of the lower end of the left ureter, also numerous shadows scattered throughout both renal areas. A ureteric catheter was arrested low down in the left ureter and a film then showed the group of small shadows to be lying at its tip. After further dilatation of the lower portion of the ureter by bougies five small calculi had been passed.

During the six months which had since elapsed, the patient had had no symptoms, the urine had become clear and free from blood, though there was X ray evidence of many calculi being still present in each kidney.

### Prostatic Calculi.

An X ray film and operation specimen illustrating calculi in the prostate were also shown by Mr. Tait.

The patient was aged forty and gave a history of gonorrhœal infection with prostatic abscess twenty years before. Some urethritis had continued ever since. In January, 1927, he had had several operations for prostatic abscess during which the bladder had been opened suprapubically. A year previously there had been sudden acute retention and a catheter had been passed with difficulty.

For some weeks before coming under observation he had noticed difficulty in micturition, a thin stream and bearing-down pain in the perineum and rectum. The urine had been cloudy with muco-pus and some blood. The prostate had been found to be very tender with small nodules and irregular swelling. The urethra had been free, but the passage of an instrument had caused a shivering attack. X ray examination had revealed numerous shadows in the prostatic area with constant relationship in different planes.

The prostate had been removed by open dissection through a suprapubic wound. It was very fibrous and contained five medium sized stones and many small ones lying in cavities within the gland. The bladder wound had closed in fourteen days and the patient was passing a full stream and was without pain.

### Retinitis Proliferans.

DR. LEONARD MITCHELL showed a boy of eighteen years, who had worked as a farm hand. His sight had never been good and had not improved above $^{6}/_{60}$ in either eye. His general health was good, but the family history suggested a syphilitic taint. Nevertheless his blood serum had failed to deviate complement by the Wassermann test. Both ocular fundi showed several areas of detachment of the retina and the vitreous revealed a few suspicious looking fibrous bands. Dr. Mitchell considered the condition to be one of *retinitis proliferans*.

### Optic Atrophy.

The next case was a man, aged sixty-five years, who had noticed that the vision in his right eye began to fail fourteen days before his admission to hospital on May 29, 1926. There had been no pain and no history of previous eye trouble. General examination had revealed little abnormality save some emphysema of the lungs, but in the Wassermann test his blood serum had caused a well marked deviation of complement (strong positive). His eyes had been affected by optic neuritis in 1926 in the right eye and nothing abnormal had been seen in the left eye.

On March 24, 1927, the right optic disc had begun to atrophy, though œdema and hæmorrhages were still present, while the left disc had begun to manifest papillœdema. At the time of demonstration both discs were becoming very pale and Dr. Mitchell regarded this condition as one of optic atrophy following syphilitic inflammation.

### Cerebral Tumour.

Dr. Mitchell's third patient was a woman of fifty years who had been seen first on May 14, 1928, complaining of headache and failing vision. The history showed that, two years previously, she had had similar attacks with vomiting which lasted off and on for two months. Another similar attack had occurred nine months previously with occipital and frontal headaches and daily vomiting. The patient complained of her vision getting worse during the previous two years and lately she had had attacks of giddiness.

Cerebellar tests revealed Rombergism, a little fine tremor, but no pass pointing; otherwise the nervous system was normal.

Her blood serum failed to cause deviation of complement by the Wassermann test. Her visual fields showed no reduction. Papillœdema of three dioptres was present in each eye, while the veins in the left fundus were very full and tortuous.

Dr. Mitchell considered this to be a typical eye picture of a cerebral tumour, the eye signs being most helpful when present as in this patient.

### Chorioido-Retinitis.

Dr. Mitchell's last patient was a woman, aged sixty-four years, who was in hospital for investigation of her condition. The general findings were: a little bronchitis, some enlargement of the aorta, as shown by X rays and some enlargement of the heart to the right of the sternum, shown by percussion. In the Wassermann test a moderate amount of deviation of complement occurred (good partial). Examination of the eyes revealed right-sided vision to be $^{6}/_{9}$ with glasses, the fundus manifesting arterio-sclerosis only, but the left eye was blind and manifested an extensive old chorioido-retinitis, with a few vitreous opacities. Dr. Mitchell showed this patient as providing a good example of specific chorioido-retinitis.

### Encephalitis Periaxialis Diffusa.

DR. H. F. MAUDSLEY showed a patient who, he considered, was probably suffering from *encephalitis periaxialis diffusa* (Schilder's encephalitis). The patient was a boy, aged eleven years. He had never been robust, but had never had any definite complaint until September, 1927, when he complained of being unable to see figures on the blackboard at school. He had had slight headaches, but otherwise felt well. It had been found that he had fairly gross visual defect of both eyes. He had been examined at the Eye and Ear Hospital and signs had been found of optic atrophy of the left disc. The right disc had been normal. Neurological examinations at that time had revealed nothing abnormal. He had been slightly below normal intelligence for his age as shown by Binet and Porteus tests. His father and mother were alive and well and the patient was an only child. The Wassermann test had been carried out and no reaction had occurred.

In January, 1928, he had complained of some weakness of the right arm, together with a slight tendency to drag the right leg on walking. Later on he had complained of some weakness of his left hand and some right facial weakness had developed. The condition had been gradually and steadily progressing until at the time of demonstration he had a spastic paresis of his right upper and lower limbs, together with a definite facial paresis of the upper motor neurone type of the right side of his face. There was some *pes cavus* of both feet together with weakness of his left arm. The visual defect was still gross.

A further neurological examination revealed the optic atrophy on the left side to be slightly more pronounced. The right disc was still normal. There was slight nystagmus. The muscles of the right upper and lower limbs were hypertonic. The deep reflexes were all exaggerated, more so on the right side. The right abdominal reflex was absent, the left faintly present. Both plantar reflexes were extensor in type. There was no ataxia and no posterior column involvement could be discovered.

With reference to the differential diagnosis of the condition, it was one of steadily progressing paraplegia, commencing with loss of vision. The loss of vision was scarcely to be accounted for by the optic atrophy which was

unilateral. There were no signs of increased intracranial pressure, so that the presence of a tumour was unlikely. Congenital syphilis could be excluded probably on the serological finding.

Although there was some *pes cavus*, the progress appeared to be too rapid for a case of Friedreich's ataxia. Also, there were no signs of posterior column involvement. Disseminated sclerosis would not be likely to commence and progress so rapidly at this age.

Dr. Maudsley said that in 1912 Schilder had first described a condition of cerebral sclerosis, confined at first to the white matter of the *centrum ovale*, to which he gave the name *encephalitis periaxialis diffusa*. Grainger Stewart, Greenfield and Blandy (*Brain*, Part I, March, 1927) had described three cases of Schilder's encephalitis, together with the subsequent pathological findings.

Clinically, the cases were characterized by a steady progressive paraplegia, following on loss of vision or hearing. The cases so described came to a fatal termination in from eight days in one case to six months in another.

The pathological findings were those of a diffuse sclerosis commencing in the white matter of the occipital or temporal lobes. There was complete destruction of the myelin sheaths and to a lesser degree of the axis cylinders. There was extensive replacement by neuroglia. This demyelinization spread through the white matter of the cerebral hemisphere and might encroach on to mid-brain, *pons*, cerebellum or optic tracts. These plaques of sclerosis were not so sharply defined as those in disseminated sclerosis and the axis cylinders were less well preserved. More recently Symonds (*Brain*, Part I, 1928) had described a case of *encephalitis periaxialis diffusa* with the typical pathological findings. In this case two brothers had died of doubtful meningitis and a sister had had symptoms suggestive of an arrested Schilder's encephalitis. Symonds suggested the possibility of the condition being classed as a familial one in some cases.

Dr. Maudsley said that the patient under consideration presented features that were not unlike Schilder's encephalitis and it was suggested that the diagnosis of this rare condition might be tentatively made.

### General Paralysis of the Insane.

DR. R. S. ELLERY showed two patients with general paralysis of the insane treated by "Tryparsamide" injections.

The first was a man, aged thirty-eight years, who had been arrested for indecent exposure, and who on certification had worn a degenerate and vacant look, sitting with his mouth open drooling. He had been morbidly indistractable and had had some delusions that his bed was connected with that of a woman for improper purposes. His memory had been grossly defective and he had been unable to give a coherent account of himself.

The response to the Wassermann test was positive for both blood and cerebro-spinal fluid. His cerebro-spinal fluid had yielded increased cells and a positive response to the Nonne-Apelt test. His speech had been slurring, his knee jerks hyperactive and Romberg's sign had been present.

"Tryparsamide" had been given, commencing on November 18, 1927, in eight weekly injections (intravenously) of three grammes in ten cubic centimetres of sterile water. The patient had improved and a second course of "Tryparsamide" had been started on March 2, 1928. At this date the patient had been discharged from hospital at his own request, but continued to report each week for his injection.

He had been at work for two months as a bricklayer's labourer. He presented no ataxia and no Rombergism. His general health had improved considerably and he was happy and rational. Insight into his condition had returned and his memory was practically without defect.

The second patient was a man, aged forty-nine, suffering from the depressed form of general paralysis. When sent to Mont Park on October 5, 1927, he had been disorientated and much reduced mentally. His memory had been grossly defective, his speech very slurred, his pupils unequal and reflexes absent. Romberg's sign had been present. His blood and cerebro-spinal fluid had yielded a positive response to the Wassermann test, the latter containing increased cells and globulin.

His first course of "Tryparsamide" injections had been commenced on November 25, 1927, after which he had shown considerable improvement and had commenced to work in the ward.

On March 3, 1928, he had been discharged from the hospital at his own request in order to resume his work, but he reported at the hospital each week for the eight injections comprising his second course.

At the time of demonstration he manifested no mental abnormality; there was no lingual tremor, but his speech remained slightly slurring. Romberg's sign was absent. His knee jerks were present and active; his pupils remained unequal; otherwise his physical condition had returned to normal.

## NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Fisher, Walter, L.R.C.P. (Edinburgh), 1892, L.R.C.S. (Edinburgh), 1892, L.F.P.S. (Glasgow), 1892, Mayfield, Newcastle.

Freemantle, Norman Franklyn, M.B., B.S., 1925 (Univ. Melbourne), Balranald.

# Medical Societies.

## THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING OF THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA was held at the University of Adelaide on June 6, 1928.

### Racial Metabolism.

PROFESSOR EARLE, of the University of Hong Kong, gave an address on racial metabolism. His research had begun in association with the China Medical Association, the committee of which had been anxious to establish normal standards for the Chinese, in 1921. He had used, with Sir James Berry, the original Benedict graphic apparatus and in 1922, applying this method to a study of Chinese patients, had discovered a low standard of metabolism, some 10% below the normal western standard.

Benedict who had been one of those who had opposed the surface law as being the full explanation of the basal level, had repeated Earle's experiments on Chinese girls under western conditions, resident in Mount Holyoak College in Massachusetts. These students had been subsisting upon a western diet if anything richer than a normal standard and had been living the full active life of American athletic college students. His results coincided with those of Professor Earle and thus had removed the criticism that the latter's results were partly or wholly due to the low stimulus diet of rice coupled with a sedentary occupation in a warmer and therefore more relaxing climate. Thus it would appear that basal metabolism had some claim to be considered as a racial characteristic.

Professor Earle then went on to discuss the surface formulæ of Lusk and Du Bois. The surface area formula was only approximate, it being very difficult to get an accurate measure of surface area. Its use in this connexion had arisen out of Rubner's original connexion of the loss of the heat of the body with the loss of heat from a hot inanimate body, as summed up in Newton's law of cooling. Rubner's own work, however, later had disproved the sufficiency of this simple explanation.

Benedict's own conception of it was that the heat production was proportional to the area of the active protoplasmic mass of the organism and he had proposed a formula using height and weight as factors. Boothby had

then shown that the height-weight formula of Benedict could be used for calculating surface area, that is to say, the size measurement most closely related to basal metabolism was area. The area of the protoplasmic mass was probably the essential factor. The expression $W^2/_3$ might be correlated with the protoplasmic mass, even through estimations of the total nitrogen.

Professor Earle then went on to discuss the relative merits of methods used in determining basal metabolism—the gas analysis method, the oxygen absorption method and direct calorimetry. Benedict had shown that the indirect method was accurate enough and had had considerable experience in the use of the Atwater calorimeter which he himself perfected. There were other factors than surface area which influenced the basal metabolism, such as age, sex *et cetera*, the female being 10% below the male. The results obtained in Chinese had interest in connexion with the hormone theory of racial development of Keith and others and in this connexion Shellshear had shown that the thymus persisted in the Chinese. There was, however, very much scope for extension of the study to include sex and age changes in different races.

The Japanese results recently published purported to be 5% below western standards, but these had been criticized by Earle and Benedict, as the method used was not accurate enough.

Basal metabolism was approximately half of the total metabolism and a lower basal metabolic rate which the Japanese attitude of mind would seem to take as an indication of inferiority, really meant a more efficient metabolism. Professor Earle quoted the results of Miss Hindmarsh, working in Sydney with Professor Priestly, on medical students who were there shown to have a basal metabolism approximately 10% below those of the predicted values as determined by the formula of Du Bois.

DR. C. S. HICKS pointed out that Miss Hindmarsh herself had indicated the importance of the consideration of greater muscular relaxation as being partly the cause, such relaxation being more easily produced in a climate such as that of Sydney. Her figures were also associated with low nitrogen excretion, figures considerably lower than those for western ordinary standards. The whole of Miss Hindmarsh's work indicated the need for further study on the question of racial adaptation in new countries.

Dr. Hicks then demonstrated the Benedict Field portable apparatus and an interesting discussion arose chiefly on the points of anthropological interest, the hormone theory of racial development being criticized both by Professor Earle and Professor H. H. Woollard.

## Australasian Medical Publishing Company, Limited.

### ANNUAL MEETING.

THE annual meeting of the Australasian Medical Publishing Company, Limited, was held at The Printing House, Seamer Street, Glebe, New South Wales, on August 6, 1928.

#### Directors' Report.

The Chairman, Dr. W. N. Robertson, C.B.E., presented the report of the Directors as follows:

The Directors submit their report for the past year and balance sheet as at June 30, 1928, together with profit and loss account for the twelve months ended June 30, 1928.

The growth and progress of the Company's business as general printers was continued throughout the year and the accounts show a substantial profit. The additional plant referred to in the last report, the installation of which had then commenced, came into full operation in the middle of March, 1928. It has relieved the strain under which the staff and machinery had for some time been working. It has also enabled increased printing to be undertaken.

The Directors are pleased to report that Dr. Harold R. Dew's book "Hydatid Disease," referred to in the last report as "the first medical work to be printed and published by the Company," has been successfully produced and is now in the hands of readers.

THE MEDICAL JOURNAL OF AUSTRALIA completed its fourteenth year on June 30, 1928. It has maintained its high standard as a medical journal and its value as a factor in promoting and advancing medical science has continued to grow. The publication of the Transactions of the Australasian Medical Congress (British Medical Association), second session, 1927, in a series of supplements of the journal was duly accomplished. The undertaking, however, resulted in financial loss to the Company.

Dr. T. W. Lipscomb, who was chosen on April 27, 1927, to fill the casual vacancy occurring among the Directors by the retirement of Professor F. P. Sandes, and Dr. W. Kent Hughes retire from the Board of Directors in accordance with the Articles of Association, and are eligible and offer themselves for reelection.

For the financial position of the Company the members are referred to the balance sheet and profit and loss account.

(Signed) W. N. ROBERTSON,
*Chairman.*

#### Election of Directors.

Dr. T. W. Lipscomb and Dr. W. Kent Hughes were reelected to the Board of Directors.

## Correspondence.

### DENGUE FEVER.

SIR: I read with considerable interest in your issue of Saturday, August 4, the article by Dr. R. E. Nowland entitled "An Unusual Case of Dengue Fever."

The points made by the observer are of considerable interest, particularly the facts that the patient had not been out of Sydney, that the case occurred in the middle of winter when mosquitoes are practically non-existent in her neighbourhood and that she lived within some two hundred yards of the wharves.

During the summer season, when mosquitoes are extremely plentiful and chances of conveyance are at a maximum, the occurrence of a case in Sydney would be of very considerable interest. During the winter there are so many factors operating against the conveyance of the disease that, if established as dengue, it is a truly remarkable occurrence. The symptoms, however, resemble very closely those of endemic typhus, a disease which has been reported from the Atherton Tableland, Queensland (17° south) right through Australia to the south-western corner of Western Australia. At present there are cases in several States. Several have been reported from the Queensland-New South Wales border quite recently and the relationship of cases to wharves, grain storage places or occupational pursuits involving contact with rodents, gives the locality of the residence of the patient described by Dr. Nowland further significance. There is no record of a Weil-Felix test being made in the present instance and I would hazard the suggestion that unless endemic typhus was definitely so excluded, the diagnosis of dengue is doubtful.

Yours, etc.,
R. W. CILENTO,
Director,
Division of Tropical Hygiene.

Brisbane.
August 6, 1928.

# Proceedings of the Australian Medical Boards.

## TASMANIA.

THE undermentioned has been registered under the provisions of *The Medical Act*, 1918, of Tasmania, as a duly qualified medical practitioner:

Gaha, Thomas Robert, M.R.C.S. (England), L.R.C.P. (London), Hobart.

# Books Received.

SURGICAL NURSING AND AFTER-TREATMENT: A HAND-BOOK FOR NURSES AND OTHERS, by H. C. Rutherford Darling, M.D., M.S. (London), F.R.C.S., F.R.F.P.S. (Glasgow); Third Edition; 1928. London: J. and A. Churchill. Crown 8vo., pp. 638, with illustrations.

SOME PRINCIPLES OF DIAGNOSIS, PROGNOSIS AND TREATMENT: A TRILOGY, by Robert Hutchison, M.D., F.R.C.P.; 1928. Bristol: John Wright and Sons, Limited. Crown 8vo., pp. 54. Price: 2s. 6d. net.

HERITAGE OF ILLS: SOME COMMON DISEASES AND THEIR PREVENTION, by Ethel Browning, M.D.; 1928. London: William Heinemann (Medical Books) Limited. Crown 8vo., pp. 132. Price: 3s. 6d. net.

THE RADIOGRAPHY OF THE CHEST; Volume II, by Walker Overend, M.A., M.D. (Oxon.), B.Sc. (London); 1928. London: William Heinemann (Medical Books) Limited. Demy 8vo., pp. 196. Price: 21s. net.

LOW BLOOD PRESSURE: ITS CAUSES AND SIGNIFICANCE, by J. F. Halls Dally, M.A., M.D., B.Chir. (Cantab.), M.R.C.P. (London); 1928. London: William Heinemann (Medical Books) Limited. Demy 8vo., pp. 274. Price: 15s. net.

# Diary for the Month.

AUG. 20.—New South Wales Branch, B.M.A.: Organization and Science Committee.
AUG. 21.—Tasmanian Branch, B.M.A.: Council.
AUG. 21.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
AUG. 22.—Victorian Branch, B.M.A.: Council.
AUG. 24.—Queensland Branch, B.M.A.: Council.
AUG. 28.—Illawarra Suburbs Medical Association, New South Wales.
AUG. 28.—New South Wales Branch, B.M.A.: Medical Politics Committee.
AUG. 30.—New South Wales Branch, B.M.A.: Branch.
AUG. 30.—South Australian Branch, B.M.A.: Branch.

# Medical Appointments.

Dr. Hugh McIntyre Birch (B.M.A.) has been appointed Junior Medical Officer at the Parkside Mental Hospital, South Australia.

* * * *

Dr. E. V. Keogh, Dr. J. C. Spencer (B.M.A.), Dr. E. A. North (B.M.A.), Dr. F. Trenerry, Dr. W. R. Trembath (B.M.A.), Dr. D. A. Dowling (B.M.A.), Dr. W. M. Bevington (B.M.A.) and Dr. W. K. McIntyre (B.M.A.) have been appointed Quarantine Officers under the provisions of the *Quarantine Act* 1908-1924.

# Medical Appointments Vacant, etc.

**For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.**

LAUNCESTON PUBLIC HOSPITAL: Junior Resident Medical Officer.

RENWICK HOSPITAL FOR INFANTS, SUMMER HILL, NEW SOUTH WALES: Resident Medical Officer.

ROYAL ALEXANDRA HOSPITAL FOR CHILDREN, NEW SOUTH WALES: Honorary Medical Vacancies.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY: Resident Medical Officer.

TOOWOOMBA HOSPITALS BOARD: Resident Medical Officers.

# Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

| BRANCH. | APPOINTMENTS. |
|---|---|
| NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney. | Australian Natives' Association.<br>Ashfield and District United Friendly Societies' Dispensary.<br>Balmain United Friendly Societies' Dispensary.<br>Friendly Society Lodges at Casino.<br>Leichhardt and Petersham United Friendly Societies' Dispensary.<br>Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney.<br>Marrickville United Friendly Societies' Dispensary.<br>People's Prudential Benefit Society.<br>Phœnix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries.<br>Australian Prudential Association Proprietary, Limited.<br>Mutual National Provident Club.<br>National Provident Association.<br>Hospital or other appointments outside Victoria. |
| QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane. | Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing.<br>Brisbane United Friendly Society Institute.<br>Stannary Hills Hospital. |
| SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide. | All Contract Practice Appointments in South Australia.<br>Booleroo Centre Medical Club. |
| WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |
| NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington. | Friendly Society Lodges, Wellington, New Zealand. |

Medical practitioners are requested not to apply for appointments to position at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

# Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor." THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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